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FEBRUARY, 1949

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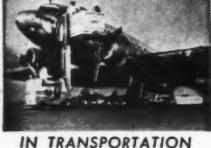
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* MH is MASS HANDLING—the systematic movement of the most units in the shortest time, at the lowest cost.



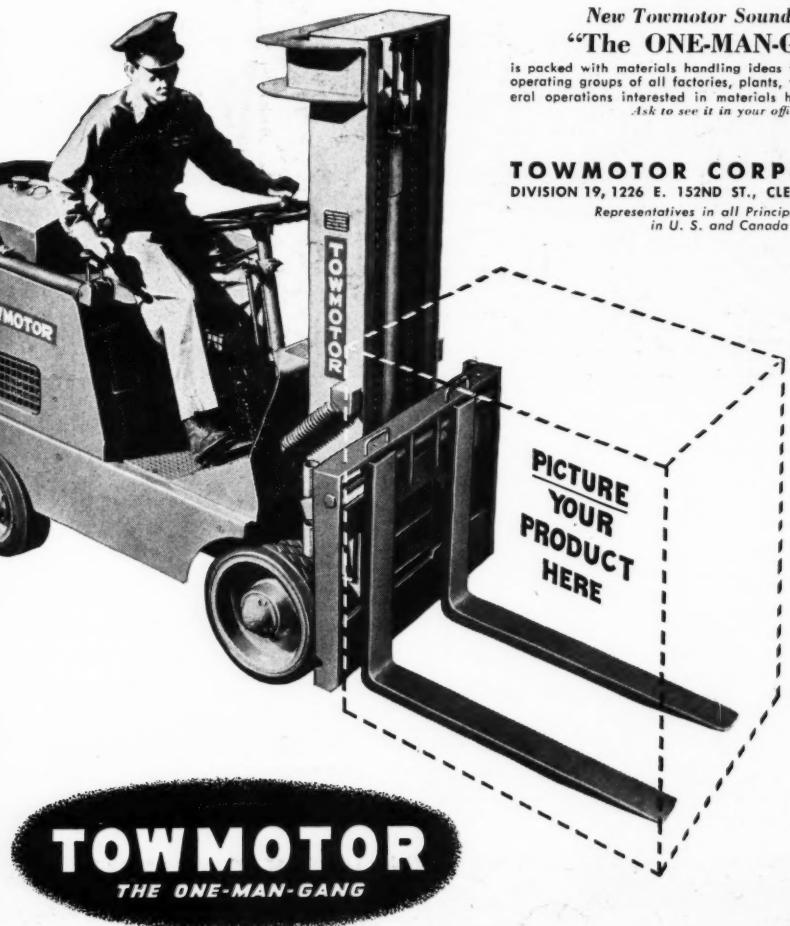
New Towmotor Sound Movie "The ONE-MAN-GANG"

is packed with materials handling ideas for management and operating groups of all factories, plants, warehouses and general operations interested in materials handling.

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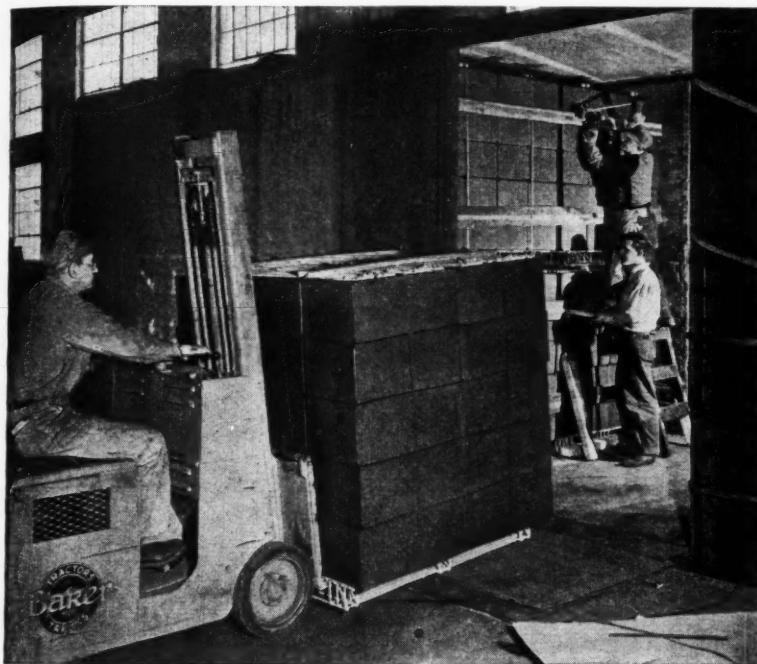
TOWMOTOR
THE ONE-MAN-GANG

FORK LIFT TRUCKS and TRACTORS

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BAKER

Light-weight FORK TRUCK helps Charles T. Brandt Inc. set a production record!



This company recently completed and shipped 140,000 special metal container units in 70 days. The job comprised 18,480,000 operations to produce assemblies from 3,080,000 separate pieces converted from 5,000,000 lbs. of sheet steel.

Making this record required on-the-dot assembly-line co-ordination of production processes — plus *packing on pallets* and *loading into box cars* for shipment on schedule.

The handling problem involved loading several cars per day with pallet loads double-decked — each pallet load weighing approximately 1400 lbs. A Baker FQH Fork Truck was in almost constant use.

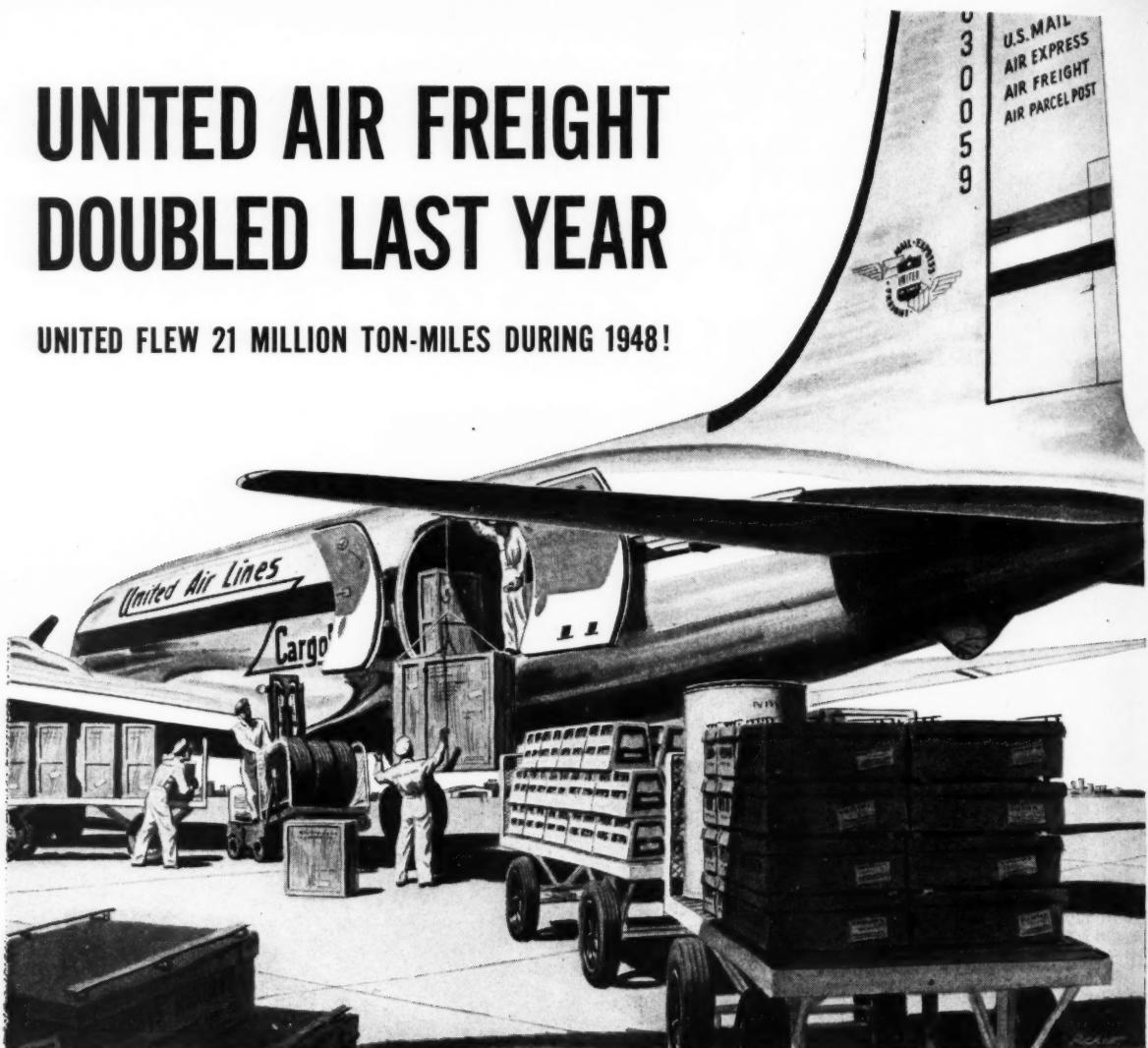
The estimated man-power saving in storing, transporting and loading was about 6 men over manual methods. In fact, it would have been virtually impossible to accomplish this record by purely manual handling.

BAKER INDUSTRIAL TRUCK DIVISION of The Baker-Raulang Company
1216 West 80th Street • Cleveland 2, Ohio
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Baker INDUSTRIAL TRUCKS

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UNITED FLEW 21 MILLION TON-MILES DURING 1948!



THE REASONS WHY ARE IMPORTANT TO YOU!

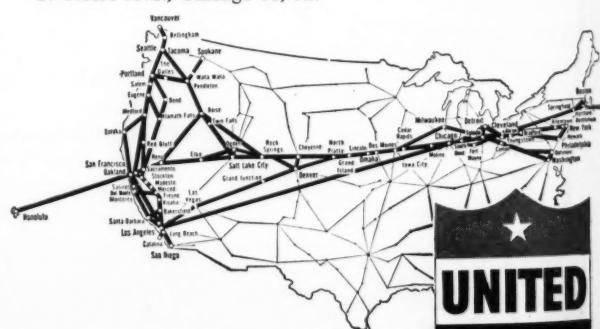
Surface transportation costs have increased sharply in recent years, but United Air Freight rates are still surprisingly low. In some cases, costs are lower than surface transportation, because less packing is required when you use United Air Freight.

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UNITED AIR LINES

This Month's Cover, showing one section of a large warehouse, illustrates the strategic role played by public warehousing in the distribution complex. Intimately linked with storage are materials and rail transportation as partially illustrated.

H. S. WEBSTER, JR.
Publisher and Editor

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Managing Editor

GEORGE POST
Assistant Manager

o o o

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STATEMENT OF POLICY . . . Our policy is based on the premise that distribution embraces all activities incident to the movement of goods in commerce. If distribution is to be made more efficient and economical, we believe business management must consider more than sales, because more than sales are involved. Marketing, while vital, is one phase only of distribution; seven other practical activities not only are necessary but condition marketing costs. Most commodities require handling, packing, transportation, warehousing, financing, insurance, and service and maintenance of one kind or another before, during or after marketing. We regard all of those activities as essential parts of distribution. Hence, the policy of DISTRIBUTION AGE is to give its readers sound ideas and factual information on methods and practices that will help them to improve and simplify their operations and to standardize and reduce their costs in all phases of distribution.

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And Oregon is a great place in which to live!

Very truly yours,
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Governor

When selecting sites and seeking new markets in Oregon, California, Colorado, Idaho, Kansas, Montana, Nebraska, Nevada, Utah, Washington, Wyoming . . .
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Omaha 2, Nebraska



Douglas McKay

One of a series of advertisements based on industrial opportunities in the states served by Union Pacific Railroad.

UNION PACIFIC RAILROAD
Road of the Streamliners

Battery-Powered INDUSTRIAL TRUCKS

where
UNIT-LOAD SAVINGS

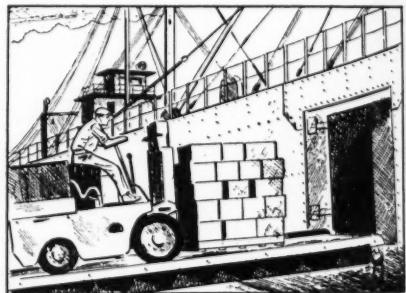
are greatest

95.6% SAVINGS IN MAN-HOURS for a pharmaceutical manufacturer in unloading a highway-truck and placing bags in storage. This operation previously took three men 4½ hours. Supplier of bagged raw material was asked to ship in unit loads. Now one man and an *electric* industrial truck do the job in 12 minutes, safely and without risk of contamination.



UNIT LOADS SAVE BUILDING NEW WAREHOUSE for food distributor. High-lift electric trucks store a wide variety of palletized products *clear to ceiling*. Actually reduce, by two-thirds, the time formerly needed for stacking. *Battery-powered* trucks handle *more* material faster—assure clean, fume-free handling without fire hazard.

210 MANUAL HANDLINGS BECOME 3 WITH UNIT LOADS. A steamship line needed 210 handlings to load one cargo item. Now with *electric* industrial trucks and unit loads the same job takes 3 handlings. Battery-power dependability in tough stop-and-go service further reduces loading time, increases number of sailings—cuts costs to shipper and consignees.



Unit-load handling cuts your costs before materials and products reach you. Unit-load handling in your plant and from your plant reduces prices you and your consignees must charge.

Your suppliers can pack to your specification. It is to their advantage and to your advantage to pack in unit loads. Unit-load handling through your own operations and to your cus-

tomers gives you important savings and competitive advantages.

With battery-powered industrial trucks, you get unit-load handling most dependably, most efficiently . . . at lowest cost per ton handled. That's why you'll find many more electric trucks than all other kinds in the service of America's cost-conscious industries.

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29-28D Forty-first Avenue, Queens Plaza, Long Island City 1, N. Y.



For information on unit-load handling with electric industrial trucks, taken from the actual experience of users, write today for your free copy of the **MATERIAL-HANDLING HANDBOOK**.

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variety of
g. Actual
the time
Battery-
material
handling

Which
is your
story?

TOTAL LOSS!

Contents of fur storage vault completely destroyed.

Costly Salvaging!

Water damage major part of fire loss.

Negligible Damage!

Carbon dioxide is quick, clean,
dry and non-damaging.

- If fire struck today, what would be your over-all loss?

Recent fire tests conducted by the Underwriters' Laboratories, Inc. ascertained the fact that an approved carbon dioxide fire extinguishing system, provided with smoke and heat detection, can definitely give you *quick, positive and complete extinguishment* of deep-seated, smoldering internal fires as well as fast burning external fires in stored furs and similar types of materials.

No water damage with carbon dioxide gas . . . only damage is that which is actually caused by the fire itself. Carbon dioxide gas is clean, dry and non-damaging . . . harmless to stored materials and warehouse equipment.

The installation of an approved carbon dioxide fire extinguishing system with smoke and heat detection provides you with the fastest and most efficient type of fire protection known, eliminates costly salvage, minimizes customer complaints, and normal business operations are resumed with little if any interruption.

Contact any of the member companies listed below for additional information and your free copy of the report on these fire tests.

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Elmira • New York

C-O-Two Fire Equipment Company
Newark 1 • New Jersey

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Chicago 1 • Illinois

Walter Kidde & Company, Inc.
Belleville 9 • New Jersey

AN OFFER TO SHIPPERS

**Up-to-date facts to show you
how to save both
dollars and days on shipments
to and through the South**

A letter, a postcard or a phone call to Delta Air Lines will bring you by return mail a set of up-to-date figures essential to every firm shipping to and through the South. These figures show an exact comparison of Delta Air Freight with first class surface rates on a point-to-point basis.

Here's Why This Information Is Essential to You:

Surface rates have risen steadily in the past three years, while the only change in Delta rates during that time has been a reduction. Thus, you need up-to-date comparisons of rates to make shipping decisions. You probably will find that in some cases you are losing days at no savings in cost when you ship on the surface. In other cases, you may find that you are losing days—and sales—to save only a few cents.

For the facts that may surprise you are these: between many pairs of points Delta Air Freight is actually lower than the first class surface rate per 100 lbs. Between many other points, the rates are comparable but you gain days at air speed. On the longest hauls, savings of two to ten days are routine, at very little extra cost.

Easy to Read Tables

Rate tables are made up for individual cities. There are no commodity rates, no zones, no complicated calculations in these tables. Just point-to-point comparisons, with air and ground rates in parallel columns. This information is published monthly in different manuals, of course, but Delta saves you time and trouble by putting the figures together in simplified form for you.

The Delta fleet is now so large that there is a take-off or landing every 2½ minutes somewhere along the system. All flights carry cargo. Special "Flying Freighters" haul bulk loads on schedules timed for



shippers' convenience. DC-3's feed into major terminals; DC-4's operate express flights with up to 7,000 pounds of cargo per flight. And the new 300-mile-an-hour DC-6's fly such routes as Chicago to Miami in four hours non-stop.



All-cargo planes handle bulk loads

Delta connects with 14 certificated airlines at key terminals. There are ideal connections through Chicago, Cincinnati, Knoxville and Atlanta from all the East and Mid-West. From the Far West, ship through either Chicago or Dallas and Fort Worth. Delta also connects with Latin-American lines at Miami, New Orleans and Dallas. Frequency of flights from all points means that your cargo keeps moving fast when you specify Delta.

Use Delta Air Freight to save dollars and days, to extend your markets and control inventories. You'll find air shipments more of a value than ever in 1949.



Delta Air Lines, Municipal Airport, Atlanta, Georgia

Please send me comparisons of Delta Air Freight and first class surface rates. I am interested in shipments from these cities:

Name.....

Firm.....

Address.....

City..... State.....

Delta Air Freight—Takes a Load Off Your Mind



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Midnight on Main Street

There are no alibis in the motion picture film delivery business. The "show must go on" seven days a week, twelve months a year . . . delay in the arrival of new film means disgruntled customers and lost revenue.

One film distributing firm operates 153 trucks more than 24,000 miles a day, serving 1215 theatres in nine different states. And there are many more GMC trucks in this fleet than any other make.

When you want reliable motor transport service . . . for any other type of company or commodity . . . GMC's day-in-and-day-out dependability really pays off.

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THE TRUCK OF VALUE



GASOLINE • DIESEL



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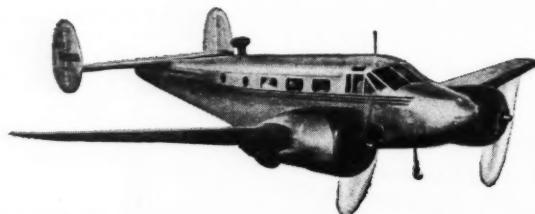
A 100-mile ditch was dug across the Isthmus of Suez . . . and the world was made 5000 miles smaller. Prime Minister Disraeli realized the vast importance of the Suez Canal—a *faster* way to reach the markets of the East. So in the name of the Cabinet, he bought part of the Canal . . . to the tune of £4,000,000! Parliament, fortunately for him, backed up his wisdom with hard cash.

Disraeli, like any man with vision, knew that markets are most productive when you utilize the fastest way of getting at them.

To the aid of today's businessman comes a superior method of getting places fast, *and frequently*:

company ownership of the twin-engine Beechcraft Executive Transport. Because of its 200-mph speed, executives are no longer desk-bound; business travel time is cut 75%. Personal attention to distant markets is again possible, and the profit side of the ledger reflects such increased activity. Travel in this 7- to 9-place luxuriously comfortable Beechcraft is travel as it should be—fast, relaxing and free of fatigue. And it is particularly economical transportation as well.

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EXECUTIVE TRANSPORT
MODEL 18

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Skylift

FORK TRUCK



**HAULS and STACKS
where other trucks
DON'T DARE OPERATE!**

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STACKS 134" HIGH
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Skylift
ELECTRIC TRUCKS

A PRODUCT OF AUTOMATIC

*Lightens
Life's Loads*

CUTS HANDLING COSTS THOUSANDS OF DOLLARS

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DIV. OF THE YALE AND TOWNE MFG. CO.
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Chicago 20, Ill.

Please send me catalog and complete
facts on new, low-priced FEATHER-
WEIGHT SKYLIFT FORK TRUCK.

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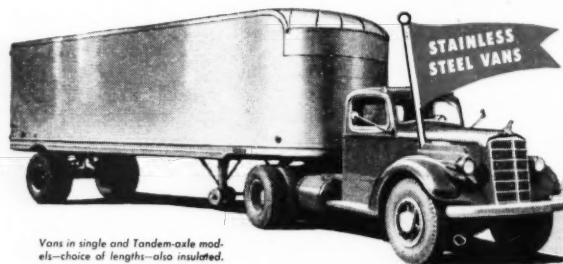
City..... Zone..... State.....



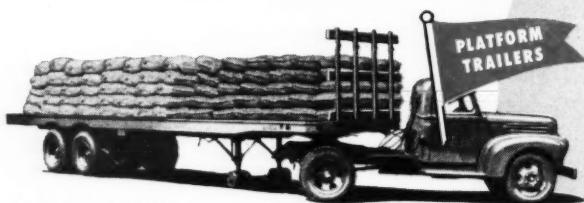
Single and Tandem-axle units in capacities from 2000 to 6500 gals.

Only Fruehauf

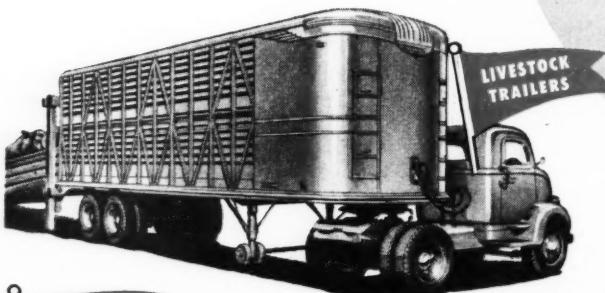
OFFERS YOU SUCH
A WIDE VARIETY OF
HAULING EQUIPMENT!



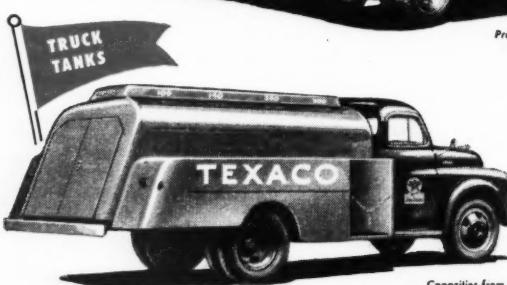
Vans in single and Tandem-axle models—choice of lengths—also insulated.



Platform, Stake and Rock, Oil, Field Floats in choice of lengths.



Provides perfect protection for stock. Available with single and tandem-axles.



Capacities from 500 to 3000 gallons.



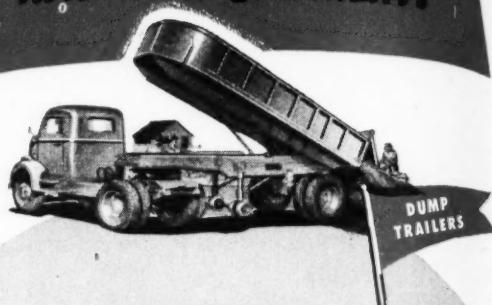
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"ENGINEERED TRANSPORTATION"



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If a standard model isn't the answer, our engineers will gladly design a unit especially for you.

Just let us know what you haul and, without obligation, we'll send complete information on a Trailer to suit your needs.

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All-Steel Bodies in wheel-housing and straight frame models - 12-14-16 ft. sizes. Many combinations - doors to suit your job.



EDITORIAL COMMENT



Public Warehousing

SELLING, to most of us, is the offering of something in exchange, usually for money. Few of us realize that selling is more complex, and more significant. Paradoxically, selling is buying. You sell a service or product—and you buy good will. You sell a service—and you buy a product, money. Product or service, each is as dynamic as the other; there is nothing static in the American economy.

Public warehousing is not static; it is as dynamic, as vital as the diesel engine catapulting down a main line from one metropolis to another, hauling the products of Marseilles, Ho-Ho-Kus and Monterey. Public warehousing is service, as much so as that freight train. It is hauling, stacking, trucking, packing and more, all rolled into one. It is a transcendent example of integration of all phases of distribution.

But how about the human element in warehousing? Public warehousing, from the storage angle, is a waiting game. The danger there is that the older function of public warehousing—to receive, store and dispatch goods—can sometimes be transmuted into a psychological incubus. Putting this differently, waiting for business can become waiting for the other fellow, letting the initiative lie with the shipper or the carrier. Waiting can become an attitude: it is on a par with the concept of sales as a one-way street. Selling is buying too. The public warehouseman has to go out and sell, not merely his storage function but his transporting, financing, inventory, consolidating, packing and other functions as well. He must buy, and the one big commodity he has got to buy is good will; he is getting an option on other transactions in the future through good will and the promise of even better service. He has got to prove to shippers that, even in storing itself, he has more to offer than the shipper can ever provide for himself. There is an art to this type of public service: choosing the right kind of packing, the right kind of materials handling equipment, the right height for stacking, the right truck....

Public warehousing must be dynamic. It can't just wait for the business cycle to catch up: public warehousemen have to go out and make their own cycle. If some have no extra space right now, why think that the smart thing to do is to pull in horns and be cautious—and wait. Some

public warehousemen are wiser; they are expanding. One public warehouseman we know of has doubled his space. He is progressive; his thinking is not one of fear and frustration; he is not selling service short. He has faith in the system of enterprise, and by go-getterism and confidence in the future is nurturing free enterprise. Another—and we discuss it in this issue—came up with a materials handling system which is modern, efficient, and a money-maker. This group of warehouses didn't stand gaping for business; it got the business. That business can be rentals, packaging service, haulage, storage, consolidation . . . there is no end to service. Public warehousing is the most flexible and varied enterprise in the land.

The buying of good will, with all its inherent dynamism, can very well be done through emulation: not copying but going the other fellow one better. It all makes for progress, for more selling, and for more buying. What can the public warehousemen improve on? New handling equipment, new systems, new fire protection methods and devices, new packing techniques, better truck maintenance, freezers (fixed and portable), training methods, and what have you. This would make for cooperation, long-range planning and progress. Members would become a little less space-conscious and more service-conscious. There would be less waiting, and more doing. It would be buying equipment—and selling better services.

It is as well, at this point, to remind the public warehousemen of the great advantage which they have over private warehousemen. The latter are irrevocably linked up with one establishment, with one business. Should anything happen to reduce demand for that company's goods, the warehouse it feeds goes hungry. And the overhead goes on and on. Public warehouses (excluding agricultural storage) have no such liability. Perhaps they don't have the upward swings that characterize some companies' volume and net; neither do they have repeated sharp slumps. If to this stability is added conservative pricing to encourage public storage use, plus ample space and the best obtainable equipment, shippers will be even more inclined to use public warehouses in preference to their own facilities.

NEXT MONTH

DISTRIBUTION AGE for MARCH will present:

Everyone's talking cost reduction. And who has more right to talk about it than Jack McCormack, free-lance traffic manager. In "THE STOP-OFF PRIVILEGE," Henry G. Elwell's engaging traffic expert discusses the role played by the stop-off privilege. ". . . the privilege . . . provides for a shipper to send his products directly to various customers at carload rates, and also enables him to maintain a reasonable amount of stock in public warehouses for prompt delivery to buyers in local areas as orders are received."

Many small towns have not been getting airline all-cargo service because of need for clarification of the government position on air mail rates and the need for determining the potential business which might accrue from such new points. The CAB, in its decisions in the Braniff Airways and Delta Air Lines mail rate cases, has thrown open to all-cargo plane service a large number of towns. Whether these towns will get the service, however, depends on the attitude the airlines take toward serving these certificated towns. It is one thing "to open up territory and another for the airlines to land planes there." John H. Frederick, in a pungent article on "REAL AIR-CARGO FOR EVERYONE," develops the problems involved in expansion of aircargo service and indicates the possibilities for such service. He stresses that much depends on the willingness of the Board to meet losses which may be met in such expanded service.

There is an old "saw" to the effect that "Money breeds money." What M. W. Potts, our materials handling consultant, can't see is why business men, who fully subscribe to this approach in almost all their activities, fail to do so in connection with materials handling equipment. As he will point out in his article on "FINANCING MATERIALS HANDLING EQUIPMENT," management exercises greater caution in the purchase of its materials handling equipment than it exercises in the purchase of such allied items as packaging and transportation equipment. "Yet materials handling equipment pays for itself no less quickly than do these other items. . . . the purchase of materials handling equipment represents (a form of saving)."

LETTERS to the *Editor*

To the Editor:

I read your magazine with considerable interest for some months, but to me it seems that the name of the magazine and field which you cover do not jibe.

In the "Statement of Policy" on page 3 of the current issue you speak of embracing all activities incident to the movement of goods in commerce. The movement of goods in commerce, that is, the physical movement is transportation, which is but a small part of distribution. Distribution is all which takes place to a commodity between the time it is ready for packing at the factory until it goes into use in the hands of consumer or user. Your issues, in the past, have dealt largely with the packing and transportation angles which are only a small part of the entire distribution cost. This is a general comment. Your article dealing with the basing point is very interesting. This is a distribution matter and, of course, not transportation.

An angle that someone ought to tackle is the theory of price making. What is a list price? What is an auction price? What is a contract price? What is the difference between a bid and a quotation, etc.?

—A general traffic manager.

Editor's Comment: The above letter is particularly valuable since it is forthright and comprehensive. For the latter reason, it will be desirable to take the statements point by point. In the first place, movement is not only transportation but, as indicated in the January editorial, movement stemming from materials handling, warehousing, finance and marketing. Even packing and packaging entail some movement in the commodity. Movement (i.e., distribution) is recognized by the writer as consisting of physical and nonphysical elements. But transportation is not the only physical phase of distribution; materials handling is largely a physical phase, as is transportation. We say "largely" since transportation, handling or any distribution phase has greater or lesser amounts of planning, methods and systems.

Secondly, transportation is not so small a part of distribution. What the writer has in mind, of course, is that transportation costs as such are a small part of the entire distribution cost, as he points out later in his letter. It is just as well to stress that there

are two conceptions of transportation costs: looking at them as covering only the cost of transporting the final product and looking at all the accumulated transportation costs which go to make up the final product. Raw materials must be transported, as must be semi-finished goods and even finished goods going to make up the final product. In the case of many products, transportation costs can be a very large item. The ICC has made at least one major study of transportation costs and such costs, in the case of more complex products, can run very high as a percent of the market price.

Point 3: Distribution as we see it is not "all which takes place to a commodity between the time it is ready for packing at the factory until it goes into use in the hands of consumer or user." Distribution begins at the raw materials end and ceases at the point of final consumption of the product. To give a simple illustration, ore may be transported from the pithead by conveyor or truck or what have you; this is distribution movement. Distribution may occur many times before the product is finally delivered; at the raw material stage, the semi-finished stage, finished stage, delivery to the wholesaler, retailer, etc., etc. In the old concept, distribution was synonymous with marketing; to us, marketing is one phase of distribution.

The writer's statement that the basing point decision does not involve transportation is a very moot point. If it involves distribution, it involves transportation. Certainly, even if (as was once feared) dozens of plants take to the hills to get nearer the supply source, it will affect transportation. Besides, part of the basing point problem itself involved the question of transportation charges. What the writer probably meant was that the transportation charge end of the problem was largely academic. With this we readily agree. We would like to add further that "viewing with alarm" everytime the government legal minds get busy makes for exaggeration and wishful thinking even if it does put a chill into government bureaucrats.

As to the last paragraph of the letter, questions of definition have been treated at length by various government publications, particularly in connection with the tobacco industry and the cotton markets in the South.



1. Look where the groceries grow!

The American farmer is the world's biggest user of trucks. He depends on reliable, low-cost hauling...so he uses thousands of International Trucks.



2. Look at the meat fleet!

Many of the trucks that keep meat moving mouthward are International Trucks. They are designed, engineered and built for this particular job by a company that has been building trucks for 42 years.



3. Look how the canning is coming!

A gigantic network of trucking systems places plenty-of-million cans on grocers' shelves.

Many of the trucks in those systems are International Trucks—specialized trucks built to do specialized jobs.



4. Look how the bread rolls!

Families count on daily delivery of the staff of life.

Leading bakeries count on the International-Metro, too. They find that this multi-stop delivery truck slices delivery costs-per-loaf, helps drivers.

It's millions of miles from markets to mouths...



5. So think how many meals-an-hour trucks like this must travel!

Millions eat good food every day only because American industry and commerce pitch in to keep the calories coming.

Our part in that picture is—TRUCKS. All kinds. There are 22 basic International Trucks. There are different engines (gasoline, diesel and butane), wheelbases, axles, transmissions and other components for efficient specialization-of-truck-to-job. Gross weight ratings range from 4,400 to 90,000 lbs.

For trucks to haul food, for trucks to haul *anything*, for trucks that are the "Standard of the Highway," see your International Dealer or Branch.



Other International Harvester Products
Farmall Tractors and Machines
Industrial Power . . . Refrigeration

Tune in James Melton and "Harvest of Stars,"
CBS, Wednesday evenings



INTERNATIONAL TRUCKS

INTERNATIONAL HARVESTER COMPANY • CHICAGO

NOTICE TO SHIPPERS
THIS CAR IS EQUIPPED WITH A



SECURE BLOCKING
BY NAILING INTO GROOVES
BETWEEN THE FLOOR CHANNELS
USE 16 OR 20 PENNY NAILS



These loading instructions are painted on the linings of boxcars that do a better job of hauling your freight. Shippers who've used cars equipped with NAILABLE STEEL FLOORING* have found that they better protect goods in transit, they cut down car supply problems, and they permit full use of mechanical handling equipment.

Here Are Some of the Reasons Why:

Power lift trucks *can't* break through NAILABLE STEEL FLOORING. You can use your five-ton fork lifts with no worry about weak floors.

NAILABLE STEEL FLOORING is durable; it stays in good condition for all types of freight. This means *more useful* cars; cars that you don't have to kick out empty

because of bad flooring or spot for loading according to floor condition.

Freight blocked on NAILABLE STEEL FLOORING *stays blocked*. Its nail-holding power is such that the blocking gives way before the nails pull out of the nailing grooves. Yet nails are easily driven—and readily removed with an ordinary claw bar.

*PATENTS PENDING COPYRIGHT 1948 BY GREAT LAKES STEEL CORPORATION

WRITE US if you'd like to see a car equipped with NAILABLE STEEL FLOORING. We follow the movements of many of the cars now in use and will be glad to let you know when there's one in your area.

GREAT LAKES STEEL CORPORATION

Steel Floor Division • 3576 Penobscot Building • Detroit 26, Mich.
UNIT OF NATIONAL STEEL CORPORATION



Mechanization + Methods = Efficient Warehousing

The four Lehigh warehouses were modernized and standardized largely on the basis of storage battery-powered fork trucks. This new equipment was carefully integrated with conveyors, platform trucks and other equipment. The result was economy, increased output, and greater efficiency.

By IRA S. FRENCH

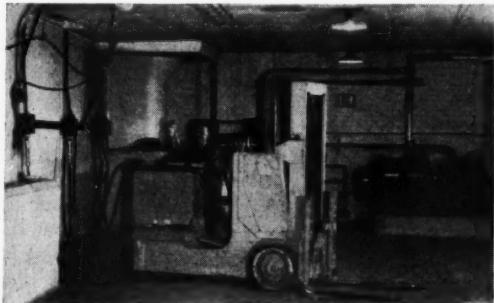
REALIZING, several years ago, that in order to cope with competition and rising costs, some method had to be found to increase productivity and reduce costs, the Lehigh Warehouse & Transportation Co. of Newark, N. J. (They operate four warehouses, three in New Jersey, one in New York.) asked top company personnel and an outside consulting firm to make a survey and submit recommendations. The opinions proffered by the two groups were essentially the same: an over-all, controlled program of mechaniza-

tion would go a long way toward increasing the company's productivity and decreasing its burden. A further suggestion called for the installation of a uniform system of forms and procedures to expedite the flow of orders and instructions.

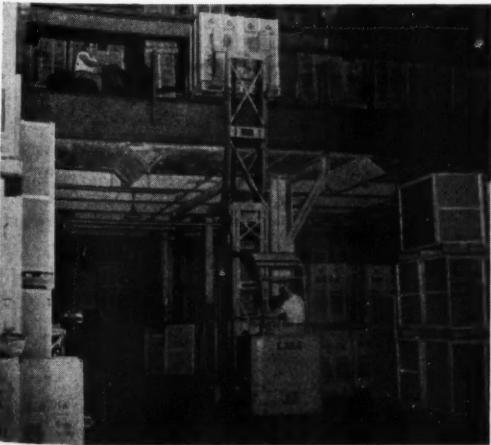
Today, as a result of action taken on these recommendations, three of the company's warehouses are 100 percent palletized, and all are using battery-powered fork trucks for movement of goods and storing in unit loads. The fourth warehouse, located in Jersey City, is largely

leased space and therefore not subject to control over material handling methods by the lessor. Such mechanical equipment as hand trucks, platform trailers, battery-powered driver-lead trucks, derricks, electric hoists and overhead traveling cranes are being widely utilized by the company. In appraising the results of the overall equipment program, J. Leo Cooke, executive vice-president, stated that, "On an average . . . we have gained a 25 to 35 percent better utilization of man-hours. In some

(Continued on page 57)



All four of the warehouses operated by Lehigh are equipped with charging stations, similar to the one shown at left.



Broad aisles and ample room for operations are in evidence in the Internal Revenue Bond Room.

A 6,000-lb. capacity, battery-powered fork truck (with lift of 220 inches) moving a palletized unit load of two carton-crated washing machines to balcony area. Note small truck above.



FIELD

THE present transitional economy has created considerable concern credit-wise. Many manufacturers and producers are faced with the serious problem of assisting their distributors in carrying a sufficient and varied inventory to meet consumer demand and still protect themselves in the event the distributors become financially involved. There is increased danger that many suppliers will be placed in the position of a general creditor for goods sold on an extended credit basis. Some manufacturers and producers are demanding cash on delivery, which procedure in most cases works considerable hardship on the distributors. In order to comply with such requirements, some distributors buy in smaller quantities with a resulting loss in bulk-purchase discounts and freight rates. There is a solution to this problem that has proved itself satisfactory to all parties concerned; this is the use of field warehousing.

The main function of field warehousing has been and is the placing of inventory on the premises of a borrower in a legal collateral position for bank loan purposes. However, many new uses for this service have developed through the years to fit in with the situations that arise in everyday commercial activity. It is used as an inventory control medium by many concerns in varied industries where the need for bank borrowing does not exist. Accounting firms take advantage of the experience of field warehouse operators in checking physical inventories by retaining their services to compile or prove the merchandise-on-hand figures needed for financial statements. Our government found that the training and experience of competent field warehousemen made their services invaluable in establishing and operating storage facilities for the stockpiling of critical materials. It has other uses of value to industry in general, but at the moment we are concerned with its application as a means of assisting manufacturers and processors in their distribution problems.

First, we will assume that the average manufacturer or producer does not know what field warehousing is, and frankly our experience has shown that such is the case. We will therefore explain the governing factors in establishing and operating a field ware-

house. In order that the field warehouseman might have a legal right to operate at or on a certain location, it is essential that a leasing arrangement be made whereby he obtains physical possession of the site. In most cases, the leased space is where the user of the service stores his inventory. Thus a rehandling of merchandise on hand to be used for bank loan or other purposes is avoided. A warehouse agreement setting forth the cost of the service and the obligations of the user and the warehouseman is entered into by both parties. To avoid added cost on the part of the user and to obtain for the warehouseman suitable employes, it is common practice for the warehouseman to retain two or more individuals from the staff of the user to act as warehouse custodians. They are hired by the warehouseman at the same salary formerly paid by the user, who reimburses the warehouseman for this cost. Each custodian or store-keeper is bonded in sizable amounts and is responsible to his new employer for the proper operation of the warehouse under his supervision. Usually, when they have finished their daily duties for the warehouseman they are permitted to assist their former employer. In this manner a bonded warehouse operation is set up on the premises of the user of the service.

There are several ways in which

Field warehousing is of great importance in helping producers meet their distribution problems . . . It makes higher discounts available on bulk purchases, enables distributors to maintain inventory and increases fluidity in working capital.

FIELD WAREHOUSING . . . A CREDIT TOOL

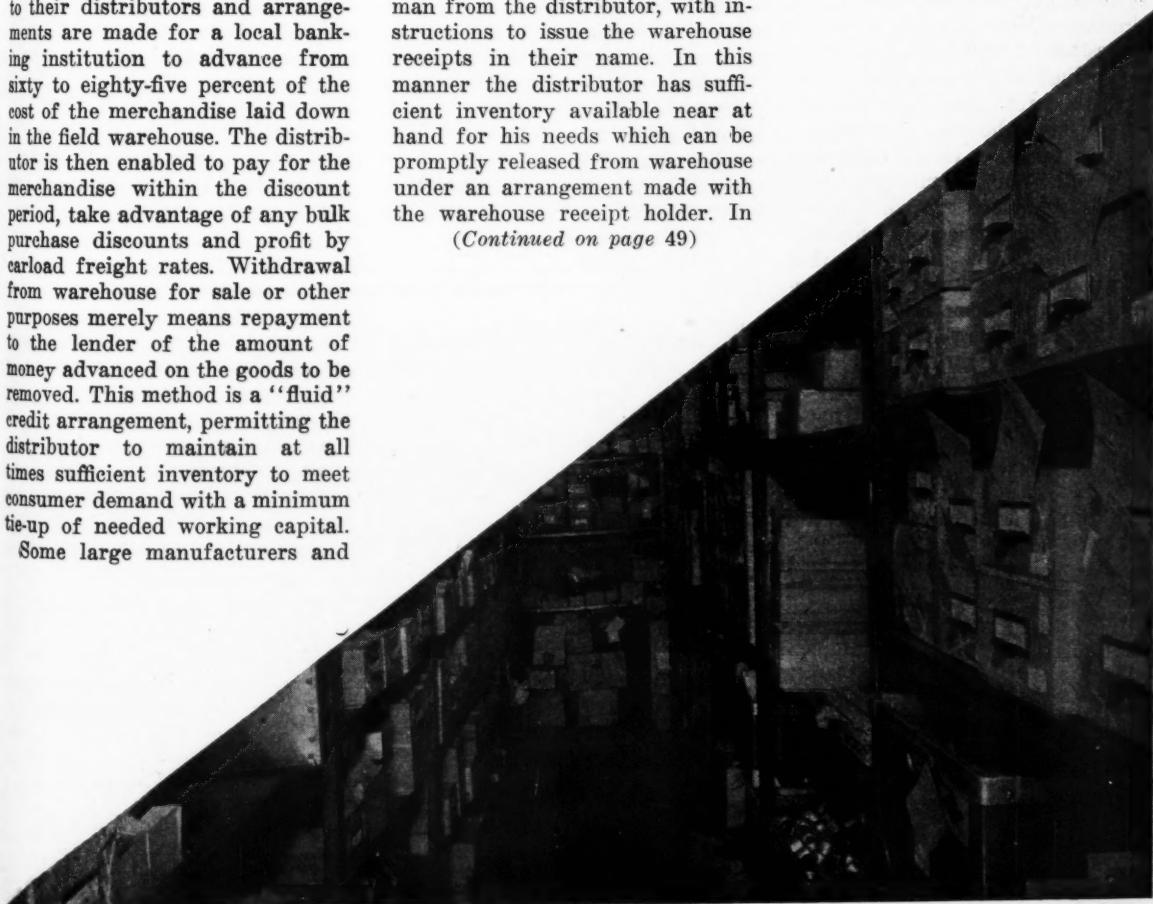
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Some large manufacturers and

producers assist their distributors and yet retain title in the merchandise by shipping direct to the field warehouse, located on premises under lease to the warehouseman from the distributor, with instructions to issue the warehouse receipts in their name. In this manner the distributor has sufficient inventory available near at hand for his needs which can be promptly released from warehouse under an arrangement made with the warehouse receipt holder. In

(Continued on page 49)

by J. J. McMACKIN
Vice President, Tidewater Field Warehouses, Inc.



PACKING IN A

By CHARLES L. SAPERSTEIN
Packaging Consultant

THE human factor is one of the barriers to perfect shipping. There are a few industrial associations which have done credit to themselves in studying the entire problem of shipping preparation and then issuing a packing, crating and loading code which is official for that industry. But freight which reflects the benefit of such dependable guidance represents only a very small part of the total daily cargo carried by all forms of transportation.

This article is addressed particularly to those shipping activities where rigid, fixed packaging ideas of one man influence or control the method of preparing goods for shipment. More specifically, it has a message of importance for those individuals who themselves are responsible for planning and accomplishing the physical preparation of outgoing freight and who have fallen into the rut of a single style of standard container to answer a wide variety of shipping requirements. We find today that many otherwise progressive shipping organizations are following the line of least resistance when it comes to determining what type and style of container is best for a given purpose. Long ago, the packing and crating chief arrived at his "pet" standard shipping unit and it would be a safe conclusion that this standard continues to prevail regardless of the demands that a specific shipment may make on a shipping container.

This situation is understandable, particularly under circumstances where lack of a standard technique might spell completely inadequate shipping preparation. It may be well in some cases that a good single style of container has been introduced, mainly through a process of trial and error. The man in charge finds a certain type of case which seems to stand up for his

purposes. If he is not well-versed in the fundamentals of case-construction, he will tend to let well-enough alone. Also, since no one else in the organization is prepared to say definitely when variations might improve the outcome or achieve the same effect with less expense, the die is cast for a certain style shipping container which may in time become almost a trademark for that shipping activity.

This tendency to lean on one method of handling becomes more pronounced as the nature of the handling operation calls increasingly for manual labor. Thus, in the realm of heavier packing and crating, with car-blocking and bracing and even in loading, stowing and other shipping techniques a large crew of workers will be handling a job in a manner which reflects the ability and, sometimes, the limitations of one man.

Where the individual in charge has had the training or the ca-

pacity to observe and absorb a multitude of ideas to fit all demands in preparing for perfect shipping, then the leadership is as it ought to be. The approach to each shipping assignment is solidly grounded, but so elastic as to be able to verify which among several techniques will best insure safe arrival of the product. The ideal shipping foreman is never sure, but is always prodding and probing to find a better solution; he knows how to adapt improved methods on his own operation.

A visit to a number of shipping departments (all responsible for preparing similar freight for road, rail, air or water carriers) will show even a casual observer that "set" rather than flexible leadership predominates in the field of cargo preparation. Moreover, if such a tour of, say twelve activities in the same related field revealed even a few handling the shipping job in a similar manner,

Packaging for shipment requires a study of the special requirements of each item and the use of various types of material.



IN A VACUUM

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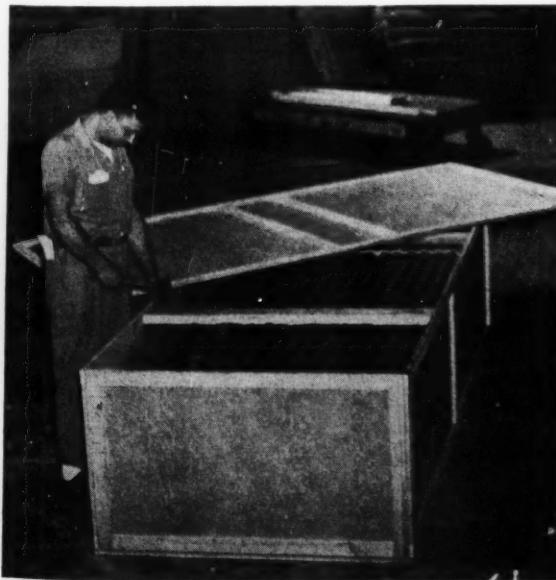
we could safely conclude that this method was the outgrowth both of study and a comparison of experiences. A visit to a dozen different packing departments, all handling the same type of freight, too often reveals as many fundamentally different approaches to the same problem.

Gus, the guiding hand at activity "A" may favor an open crate, reinforced with a single diagonal on each side, all made of uniform size boards, three-fourths in. thick by five in. in width. His may be an excellently constructed shipping unit and one ideal for many purposes. But Gus finds a way of making this crate answer for the slightest load as well as for loads which beg for greater protection.

John, the working foreman at activity "B", has discovered the merits and advantages of cleated fibreboard shipping containers. Now, there is nothing wrong in

(Continued on page 53)

Nailing up a crate prior to setting on the lid. Note employment of cross-pieces and fiberboard.



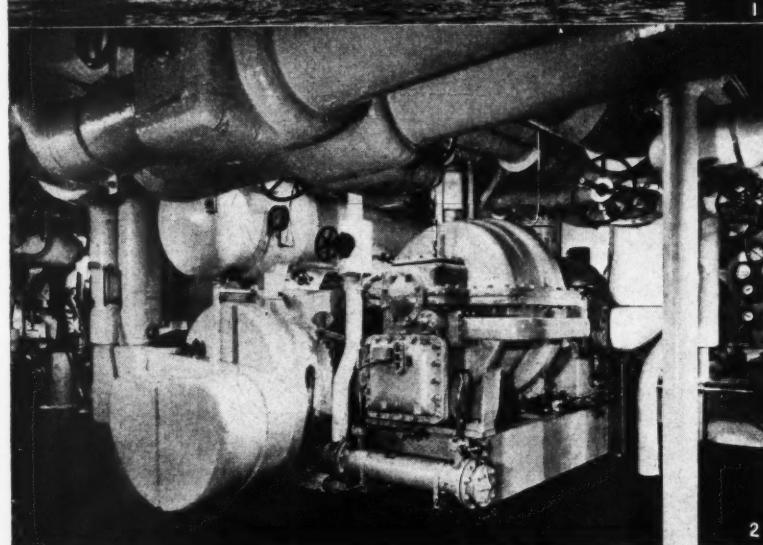
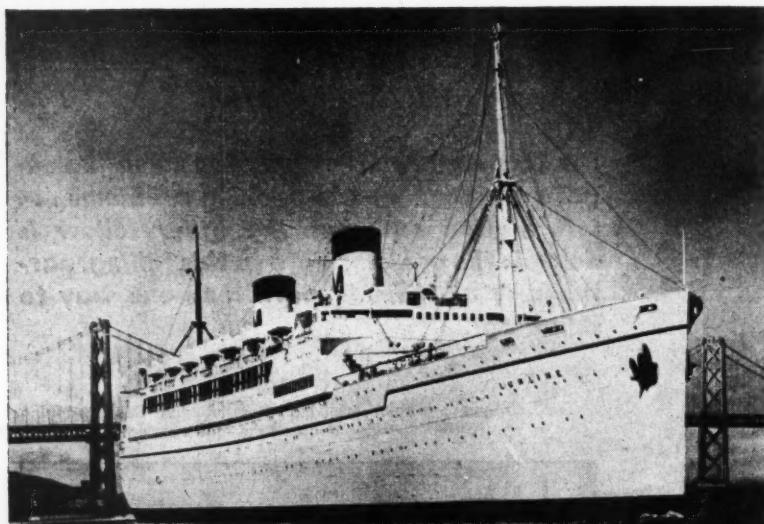
Packers are prone to apply too much "home-grown" precedent to packing problems . . . Information on what the other fellow is doing is the best antidote to this failing, particularly as there is more than one way to skin a cat.

The unit-load principle, involving a pallet and steel strapping. Pattern-stacking increased the load's strength.

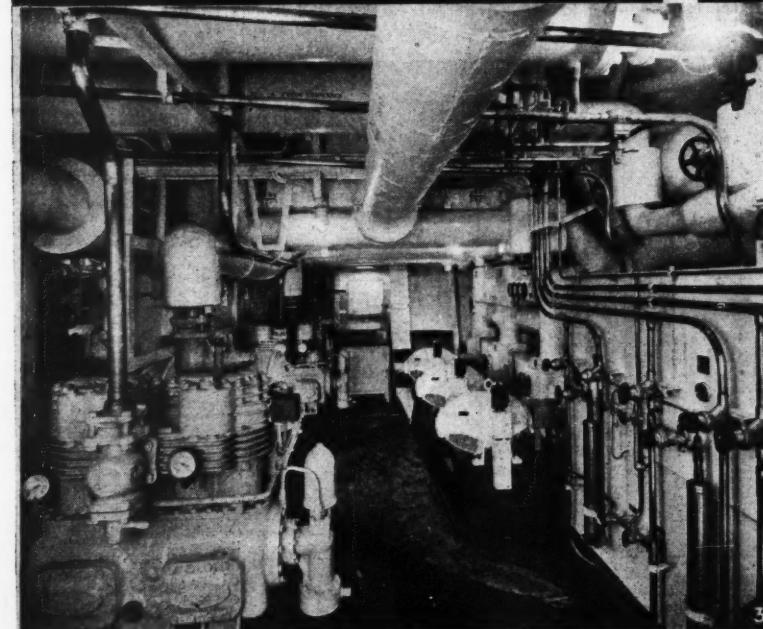


Radios are delicate devices and require special packaging techniques. In this case, a wirebound crate was used.





2



3

THE use of mechanical refrigeration for the preservation of food on shipboard was first introduced successfully in the 1880's on a ship of British Registry for the transportation of frozen beef. Today, practically every ocean-going vessel is equipped with a mechanical refrigeration plant. The application of refrigeration introduced to the steamship owner a new source of income through the transportation of refrigerated cargo. Considerable differences in practice exist, not only in each maritime nation, but also among companies engaged in the same trade. Until recently, no attempt had been made in this country to standardize the application of mechanical refrigeration installation on shipboard. A proposed standard which has been in the making for the last three years is now awaiting final approval by the American Society of Refrigerating Engineers.

The following are among the rea-

Presented before the Institute of Food Technologists, Western New York Section, on Saturday, Oct. 30, 1948. In Lyman Hall, Syracuse University.

1. S. S. Lurline, is completely Carrier air-conditioned, with ultra-modern refrigeration facilities for cargo and ship's stores.

2. Air conditioning aboard is provided by centrifugal refrigeration machines with a total capacity of 280 tons each.

3. Cargo high side equipment for refrigeration includes four 60-h.p. reciprocating compressors.

Modern Marine Refrigeration

Recent developments in marine refrigeration are tremendously simplifying the problems of distributing perishables. More accurate knowledge of temperature control and improved handling and storage methods are discussed in relation to existing types of equipment.

By S. W. BROWN

Chief Engineer, Marine Dept., Carrier Corp.

sons why Marine refrigeration differs from shore practice:

1. The installation should be designed to function properly under conditions of roll and pitch, to which a ship is normally subjected, and withstand normal usage under the corrosive effects of sea air and sea water.
2. The installation should be designed to operate through the complete range of climatic conditions through which the ship must travel.
3. Except in the case of a single-purpose vessel, such as a meat carrier or a banana ship, cargo refrigeration installations must be capable of preserving cargo of every nature.
4. It is essential that the system be designed for uninterrupted operation during the voyage; accordingly, stand-by plants or easily replaceable spare parts should be furnished.
5. In view of the high premium for cargo space, the equipment should be designed to occupy a minimum of space, consistent with reliability and cost.
6. The equipment should be designed to conform with the applicable rules and regulations of various regulatory agencies.

Marine refrigeration has two general classifications, (1) Ships' Stores, and (2) Cargo Refrigeration. Other applications such as fish freezing and processing have not had enough installations as yet to justify a separate classification. This topic will be dealt with later in this article.

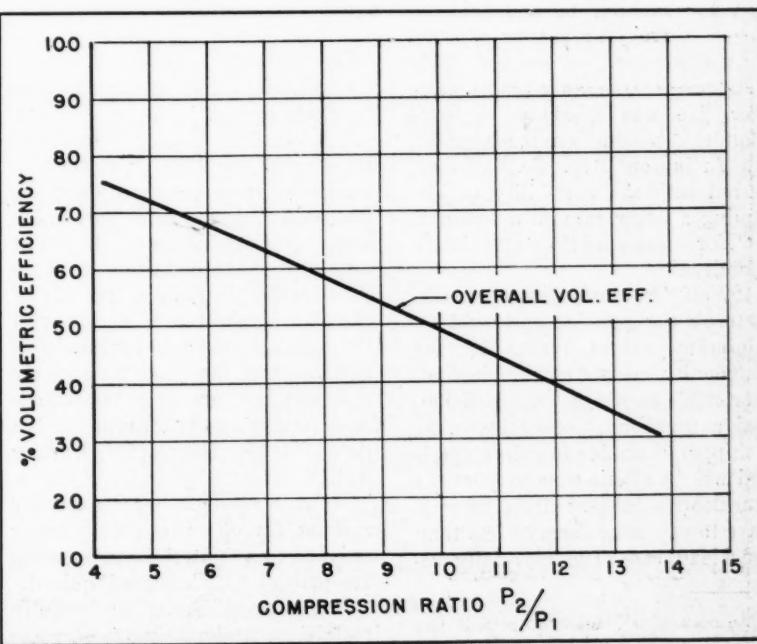
The ships' stores plant provides the refrigeration for the compartments containing the perishable foodstuffs required for the feeding of the crew and passengers during the voyage. Occasionally this plant also provides the refrigeration for ice-makers, drinking water and galley-boxes.

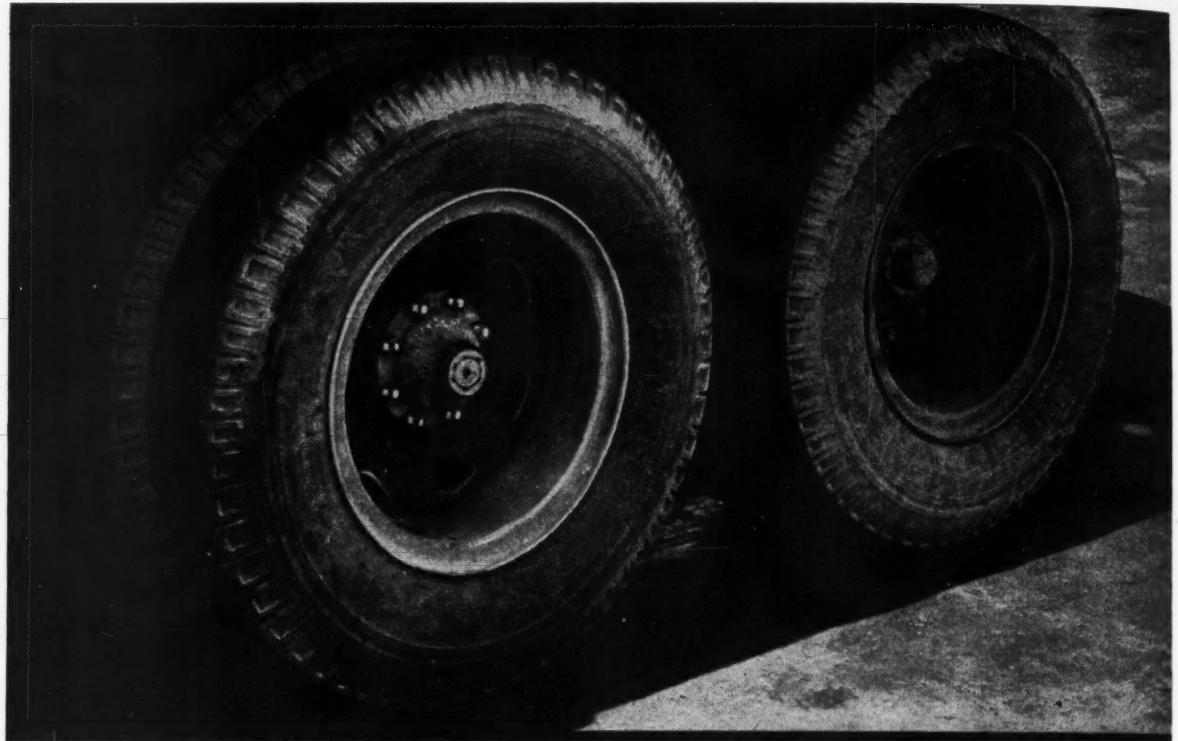
Ships' stores compartments are sub-divided to provide at least one high temperature and one low temperature. The following table shows the various compartments and temperatures provided on four classifications of U. S. cargo vessels:

(Continued on page 50)

Temperatures—Degrees F

SPACE	C1 Vessel	C2 Vessel	C3 Vessel	C4 Vessel	Liberty	Victory
Meat.....	22 to 25	20	15 to 20	15 to 20	15 to 20	15
Fish.....	20	...	15 to 20	...	15 to 20	15
Vegetable.....	35 to 40	40	42 to 45	40 to 45	40 to 45	...
Dairy.....	32 to 40	...	35 to 40	...	30 to 35	35
Thaw.....	40 to 50	45	40 to 45	40





TRUCK LOADS

THERE'S more to the making of a truckload freight rate than appears on the surface," exclaimed Jack McCormack, free lance traffic manager. He was speaking to Tom Flanders, production manager of the Arlington Mfg. Co., as they delved into the possibility of obtaining a lower rate on a product.

"For instance?" questioned Flanders.

"Well," responded McCormack, "there's the question of truckload minimum weight, value of the commodity, weight per cubic foot, carrier's earnings, competition, and a number of other items. If a shipper is unable to ship a specified weight at one time to meet the truckload minimum then he will have to pay some form of less than truckload rate. I'm especially re-

ferring to common-carrier truck operations in interstate commerce."

"Just how do you define a common carrier?" queried Flanders. "I've noticed several explanations by State courts."

"A common carrier is one who undertakes for hire or reward to transport from place to place the goods of such as choose to employ him," McCormick asserted:¹ "The language of the definition of 'common carrier' in Section 203 (a) of the Act is plain and simple, and the holdings of State courts defining the term, involving an entirely different law, are of no assistance in determining the meaning of the definition in the Motor Carrier Act."²

"Can a common carrier trucker restrict its operations to moving only certain materials in meeting competition?" Flanders inquired.

"A common carrier can lawfully restrict its undertaking to carriage

of special commodities between specific places and over specified routes," McCormack answered.³ But any stipulation between a carrier and a competitor wherein the former agrees to limit its operation in certain points is inconsistent with the duties of a common carrier. A carrier must serve all shippers indiscriminately."⁴

"May a so-called contract carrier work with a common carrier in interstate truck operations?" suggested Flanders.

"On no account," McCormack maintained. "Exchange of interstate shipments with a common carrier is common-carrier rather than contract carrier service.⁵ A contract carrier may not properly engage in such interchange without changing his status to that of a common carrier. To do that he must first obtain authority from the Interstate Commerce Commission. However, we've gotten away

(Author's Note: Names of persons and company are fictitious.)

What are truckloads and l.t.l.'s and how they can be determined is the problem put to Jack McCormack, free lance traffic manager. Rate applications, it seems, depend on a number of important considerations; truckload minimum weight, value, weight per cubic foot and other considerations may make significant differences in costs of transportation, unless properly evaluated.

by HENRY G. ELWELL

Traffic Consultant

from our main thought concerning truckloads."

"Very true," agreed Flanders, "but I wished to get an idea concerning the place of common carriers. With that in mind, I'd like to know why there should be different rates for truckloads as against less than truckload lots?"

"Volume of traffic," argued McCormack. "The difference in quantities transported as a single shipment may afford a fair and reasonable basis for differences in transportation rates.⁶ Rates subject to truckload minimum properly may be lower than less than truckload because expenses of handling truckloads are less than for less than truckload shipments."⁷

"Would it not be just as feasible to use any quantity rates in place of truckload and less than truckload rates?" Flanders protested.

"Any quantity rates on some commodities are in force," McCormack explained. "On the other hand please note that any quantity rate which in fact moves both carload and less than carload traffic is presumed to be higher than the carload and lower than the less carload would be.⁸ The same principle applies in the realm of trucking."

"That partly answers my objection, but what is the theory of the truckload minimum weight?" asked Flanders.

"The truckload minimum weight is a factor in the truckload rate and, in connection therewith, should be used in computing the truckload earnings," McCormack

replied.⁹ "The theory of minimum weights is to insure economical use of equipment and thereby increase transportation efficiency, not to serve as a direct medium for increasing or reducing carrier revenues.¹⁰ The truckload minimum weight is part of the truckload rate.¹¹ Such truckload weight, in connection with rates, determines the truckload earnings, and the propriety of the minima cannot be determined without considering the nature of the rates. Ordinarily, any reduction in a minimum weight, particularly one of only moderate proportions, should be accompanied by an appropriate adjustment of the rate level.¹² Normally this adjustment should be upward."

"One thing I don't understand," grumbled Flanders, "is the procedure of charging the same rate on the containers as for the actual commodity transported. The carriers obtain equal returns on both the container and its contents."

"Any rates published to ap-

ply on the net weight of articles are contrary to sound rate-making practices," countered McCormack.¹³

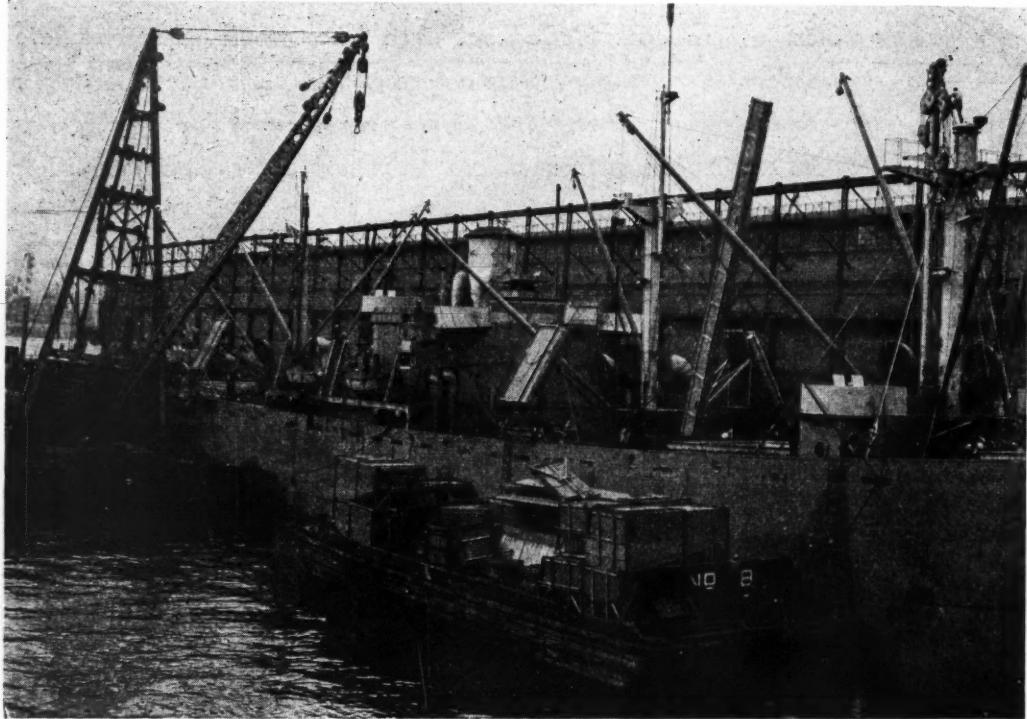
"And there's another angle," said Flanders. "Is there anything to prevent the truckers from using minimum weights which are related to the amount their particular trucks can carry?"

"It is impractical to prescribe minimum weights based on the capacity of the vehicles of individual carriers," McCormack insisted.¹⁴ "A minimum in excess of possible loading does not necessarily justify a rate lower than a lawful truckload rate.¹⁵ Minimum rates and minimum weights prescribed should be the same for all carriers regardless of the size of equipment they operate.¹⁶ Any system of rates under which a carrier would accord lower rates per 100 pounds to one shipper than to another shipper of the same commodity, between the same points and at the same minimum, would be unjust

(Continued on page 38)



Materials Handling in



THE problems of a marine terminal and warehouse and a brief discussion of the experiments being conducted to solve these problems provide plenty of food for thought for the wide-awake merchandise warehouseman. Applying some of the principles of marine terminal operation to his storage problems, the warehouseman could cut costs, conserve equipment, and save much valuable cubic footage and time.

The amazing fact is that very few of the experts ever make important note that today more time is lost while a vessel is in port than could be lost while at sea because of slowness in propulsion. It is an established fact that a vessel only earns revenue when it is on the high seas and is a dead loss while tied to a berth loading or discharging its cargo. It has been stated by one steamship authority that before the war the ships of his line spent 310 days at sea and 165 days in port, but since the war

they are spending 168 days at sea and 278 days in port. From this can be seen much of the fallacy in the arguments usually encountered. Certainly we need larger and faster vessels, but our primary need is for better handling methods in port to keep the ships on the high seas.

Some will say the only way to achieve this is the immediate construction of modern and efficient marine terminals, but with today's construction costs these terminals will rise almost as slowly as the new high-speed cargo will be built.

What, then, is the answer to this problem? The following constructive thoughts might help, from the standpoint of marine terminal operation, to whittle off some of these excess days in port. As our Committee's primary interest is materials handling, this discussion will concentrate on mechanized operation, but we would like to touch briefly on a few of the other terminal services that should be

inaugurated as an adjunct to greater actual production in movement.

1. Analysis of types of cargo and how stowed on all import vessels as well as types of cargo and stowage location on all export vessels. From this analysis transit docks can be planned to save time and movement of men and equipment.

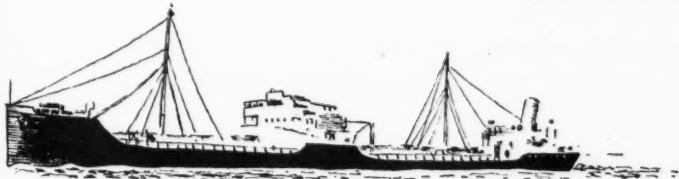
2. Establishment of a pier section who know or make themselves known to all importers, freight forwarders, customs brokers, and Federal regulatory agencies. To handle volume tonnages fast and to keep the transit docks fluid for the handling of more vessels, it is necessary that the terminal operators expedite import orders for interior movement. The pier section should insist on copies of import manifests being in their possession.

ng in Marine Terminals

The knots-per-hour speed of ships is increasing, but when inefficient materials handling delays sailings, little benefit accrues . . . More application of science in loading and storage will cut costs, speed distribution and keep the ships on the high seas.

by GERALD O. HODGE

*Chairman, Committee on Materials Handling
American Warehousemen's Association*



at least two days before vessel docking. This gives them an opportunity to obtain movement orders before cargo reaches their transit dock. Regulatory agencies can be advised of pier location and act so as to expedite their functions. All entry papers, permits, withdrawals, warehouse certificates, etc., can be prepared in advance.

3. Preparation of proper types of mechanical equipment adapted to the cargo to be handled, vessel by vessel. Advance notice as to the machines to be used must be given to the garage so that repairs and maintenance can be completed and gear ready when vessels dock.

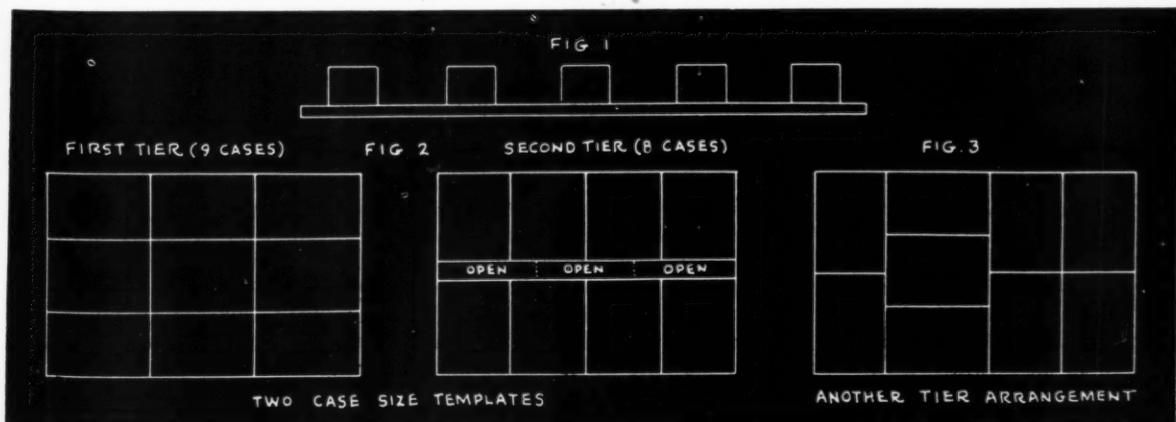
We have enumerated above only a few of the more basic preparations for good production. Let us now look at some of our materials handling problems. In every movement are involved the following:

- a. The importer or exporter.
- b. The railroad carrier.
- c. The stevedore contractor.
- d. The terminal operator.
- e. The vessel owner.

It can be readily seen that, with these various interests involved, purchase and repair of pallets becomes a major issue. The importer or exporter certainly will not buy them because of almost certain loss if his cargo is shipped out on pallets. The terminal oper-

ator cannot absorb the cost of pallets and their maintenance in order to lighten the burden and increase the productivity of the stevedore contractor. The carriers most certainly are not interested in furnishing pallets. The stevedore contractor is not going to buy pallets and maintain them for the benefit of the terminal operator. The vessel owner is paying the stevedore contractor and the terminal operator for their services and is only interested in higher productivity and lower stevedoring and terminal costs. With all these diversified interests, and their logical refusal to make large expenditures for pallets, the terminal operator, to be successful, to keep fluid, and to get speedy turn-around for clients'

(Continued on page 52)



Hotpoint's NEW Crating

A new warehouse was set up to integrate the activities of this stove plant. An intimate combination of the elements of distribution in production, warehousing and movement of the packaged product to the freight car ideally serve the company's nation-wide sales program.

BY J. G. BORSON, *Traffic Manager, Hotpoint, Inc., Chicago*



Carried along by conveyors, these completed pushbutton ranges are packed and crated for shipping.

AT the new plant of Hotpoint, Inc., located at the western edge of Chicago, we have been installing facilities and developing operating procedures for the manufacture and shipping of our new type of "pushbutton" home electric range. These appliances, when crated for shipping, are 48 in. high, have a base of 44 in. by 31 in. and weigh from 280 to 400 lbs., depending on the model.

During the manufacturing process, the parts of a range unit start

flowing westward through the plant along sub-assembly lines, and finally along four main assembly lines. In the total, the plant has nearly 70 miles of such conveyor lines. After a range unit has been completely assembled and inspected, it is lifted by an automatic elevator to an overhead conveyor line which transfers it on to our adjoining new warehouse and shipping building. Here the unit will continue along a crating assembly line. Then it will be conveyed on and automati-

cally shifted to one of seven different stub conveyor lines for spotting in a warehousing bay closely adjacent to under-roof railroad cars or motor trucks. Here the unit either will be stacked for temporary warehousing by the use of a grab-hook from an overhead crane, or stowed in a rail car or truck for immediate shipping. Because the cubic foot weight of our electric range unit makes it not favorable for motor truck stowage, approximately 95 percent of all distance shipping of range units is by rail.

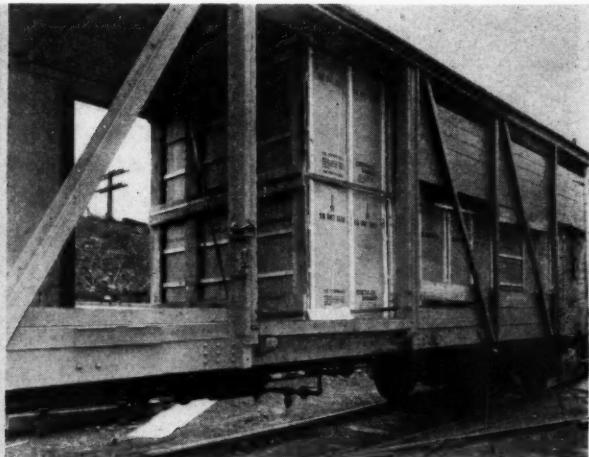
In the design and use of the warehouse building, three special operating problems were involved, and certain phases of these problems are still in the experimental testing stage. These problems are (1) unit crating, (2) conveyor and floor handling, and (3) stowage for rail shipping. Already we have been crating and shipping up to 10,000 of our electric range units per week, but the set-up of our facilities has been on the basis of an ultimate handling capacity of 12,000 units per week.

The first important step in "unit

Crating and Handling Program



Crated electric ranges are loaded on trucks for local delivery.



This view of a cut-away test car shows typical loading and bracing of Hotpoint ranges.

"Crating" is in evidence far back along the manufacturing assembly line. This is the placement and use of the slatted wood platform or skid to which the basic frame of the unit is bolted and on which the additional unit parts gradually are assembled. Also, this wood platform is the base to which the four upright sides and the top of the crate later are nailed, along the final crating assembly line. One of the rather recent changes in the design of the range unit has resulted in modifications of our crate, which also has made large cost savings in shipping possible. This design change now makes it possible to turn down the 10 in. "splash board," located at the extreme top and back side of the range, and on which also is attached the electric "control unit." This change lowered the shipping height of the range from 54 inches to 48; and this reduction of 6 inches now enables us to load two tiers of crated ranges in a box car, as against only one tier at the previous height. To level off the top of the unit for crating and also to get shipping protection, two shock-absorbing pads now are steel-

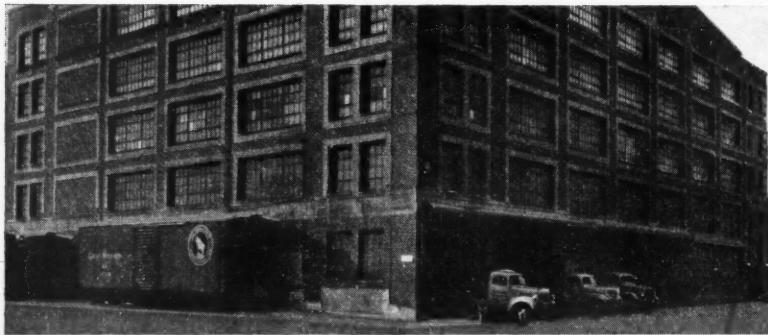
strapped to the unit, and this is the first operation along the final crating assembly line.

Much testing has been required, supervised by our plant Packaging Engineer, E. Zelinski, in the design of the six sections which are assembled to form the shipping crate for the unit, to insure the desired protective strength and rigidity. These crate sections are being made in our plant, on highly automatic fabricating machines located near the crating assembly line. One of the preliminary design tests proved that surprising strength and cost-reducing values from the use of glue, in addition to staples, are possible in attaching the wood slat needed to give lengthwise rigidity to the fibreboard side sections of the crate. The tests proved that the additional use of glue along the contact surface sides of the hardwood slats, to supplement the staples which are set three inches apart, has increased the total rigidity of completed crate by approximately 50 percent as compared with the use of the staples alone. The tests further proved that dependence on the glue alone would be

risky, in part because the use of the staples with the glue provides more certain and uniform contacts by the glue. Thus, the added rigidity provided by the glue also has made possible the use of fewer cross slats, and this has meant a saving of approximately 25 percent in costs of labor and crating materials.

One source of labor savings was the elimination of the hand placement of a cross slat formerly used, which operation had required the full time of two workers. Another cost saving, both in the original makeup of the crate and in the lessening of shipping damage, was through the use of a pressure-sensitive type of taping to hold the drawers of the range in place, as contrasted with the previous method of using a cloth-back adhesive. This change eliminated the labor of four workers along the crating line. Still another interesting development along the crating line, in the final nailing of the crate sides, has been the placement of two *left-handed nailers*, to work at the side of right-handed nailers.

(Continued on page 35)



MATERIALS

By MATTHEW W. POTTS
Materials Handling Consultant

Progress in the use of materials handling equipment by warehousemen has been rapid, particularly since the war. The wartime need for efficiency, compounded by present cost pressures has brought many types of equipment, whether large or small and whether automatic or manual, into general use.

AT THE American Warehousemen's Association's Golden Jubilee Convention, held in 1941, DISTRIBUTION AGE and the writer stressed the need for better materials handling in all types of warehouses, and at that time stood four-square on the proposition that pallets and fork trucks would do much to reduce handling costs in warehousing. Since that time, we passed through one of the greatest periods in American history; a number of warehousemen gallantly offered their services to the government in connection with the movement of supplies and materials throughout the world.

Because of the immense problem of moving materials from producer to the front lines, it was necessary to establish several types of warehouses and methods of receiving and shipping large quantities and a wide variety of supplies quickly and efficiently. Both the Army and Navy, as well as the Air Force, had their own individual supply systems, and while each one approached the problem from its own angle, nevertheless they definitely all conformed to a set of principles and rules which were uniform. Every branch of the service found that it was necessary to save time, space and manpower. Therefore, the very latest methods of warehousing were in most instances adopted, and utilized to the fullest extent. In this connection, the use

of the pallet and fork truck system proved to be an outstanding success, and was adopted by all three branches of the service, with uniform results. This was true whether the operation was in the United States, England, Europe, or on the far-flung islands of the Pacific.

Those warehousemen who participated in this great movement of materials quickly recognized the possibilities of this type of equipment in their own warehouses, which they had formerly operated as civilians. Those that were able to obtain the proper priorities immediately installed these systems in their own warehouses, and others have done the same since they returned to civilian life.

We now find the pallet and fork truck system operating in large grocery supply houses, mail-order warehouses, in public warehouses and in distribution warehouses. More installations are being made daily. All of these have resulted in direct savings to the warehouse industry, and the progressive warehouseman is searching for more ways to reduce his handling costs. While certain warehouses and shippers are palletizing unit-load shipments, many others have not been able to. However, the changes that are taking place in the thinking of the railroads, truckers, etc., indicate a trend to this type of shipment, even by the common carriers.

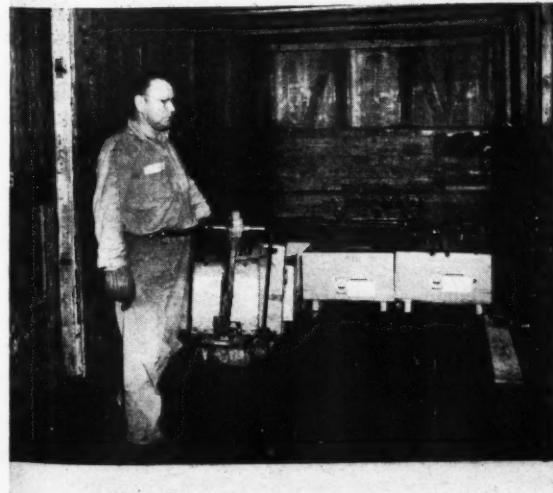
In the past, it was felt that only the larger warehouses could utilize palletized unit-load equipment, because of its expense, and the fact that it required substantial buildings and large freight elevators, etc., to move the equipment from one floor to another. Now the manufacturers of materials-handling equipment are building fork trucks which are hand-controlled, but power-operated, and which are no heavier than the average small tiering machine or portable elevator which was formerly such a necessary adjunct to successful warehouse operation. These units permit the smaller warehouses and those with light floor loads to take advantage of the palletized unit-load system of handling, and many warehouses which before were unable to use the large fork trucks, are now able to adopt the system by using these lighter and smaller units.

So many changes have been made in the construction of materials handling equipment that the warehouseman has naturally found it necessary to keep abreast of these new developments. The fact that the American Warehousemen's Association last year closely identified itself with the Second National Materials Handling Exposition in Cleveland, and participated in the First National Materials Handling Exposition, holding simultaneous

(Continued on page 35)

ALS

HANDLING IN WAREHOUSES



WHY HAVE FIRES?

"Carbon dioxide is dry and non-damaging regardless of the length of time that materials are exposed to this extinguishing medium . . . Early discovery of fires . . . by means of smoke detection equipment and prompt extinguishment tends to minimize fire and smoke damage."—Excerpts from Underwriters' Laboratories report.

'Fire-Proof' Vault Poses Stiff Problem

Fire in a supposedly fire-proof fur storage vault of Bayburn, Inc., cleaners, of 1 Broadway, Arlington, caused damage estimated at \$200,000 shortly after 5 o'clock last night. Hundreds of valuable fur garments were stored in the vault.

The three-story brick structure, built without any openings with the exception of one small door on the first floor, offered a baffling problem to firemen as they were unable to reach the blaze because of dense, choking smoke.

Foot of Masonry

Arlington public works department officials provided air compressors and drills and holes were dug through a foot of masonry to permit hose lines to enter. Another compressor was furnished by Co. B, 101st Engineers combat battalion, M. N. G. from Medford Armory.

Somerville sent one piece of apparatus and 25 provisional Arlington firemen were also mobilized to aid the regular company.

According to Chief Richard J. Tierney, cause of the fire was undetermined and the alarm was sounded by workmen nearby who saw smoke pouring from the doorway. Tierney said the blaze apparently had been smoldering for hours before the smoke was noticed.

Broadway and Alewife Brook parkway nearby were closed by police to all traffic causing a serious traffic tangle to Saturday night shoppers and homeward bound workers.

**BOSTON
SUNDAY HERALD
OCTOBER 24, 1948**

MANY disasters such as this are reported daily in the press. To many of us, this repetition has dulled us into a feeling that such losses are inevitable. Yet there is beginning to be an awareness that means are available not only to reduce sharply the occurrence of fires but even to restrain them to the point of negligibility. Fires may occur, but they need not be extensive or disastrous to life and property. In addition, fires (if they occur) need not begin a long process of examination, negotiation and settlement of salvage claims.

One of the leading warehouses in the country came to this conclusion—and did something about this. They took the step despite the fact that their "Fortress," as the giant Boston Storage Warehouse Co.'s Huntington Ave. building is called, was massive and conceivably fire-proof or explosion-proof due to its steel and concrete walls and immense foundations. It was still deemed advisable to install an ultra-modern and efficient fire detection and extinguishment system.

A few years ago, the management investigated the question of installing fire equipment, and engaged specialists to study the subject. After a year of study, it was strongly recommended that a series of installations and other changes costing \$100,000 be instituted (including heavy burglar protection). These changes are now in process of completion.

Considerable attention was given to the nature of the merchandise stored, as well as the arrangement, size and location of the various rooms. Storage facilities consist of 16 fur storage vaults, four cold storage vaults for uses other than furs and 1,700 small general storage rooms.

Furs constitute a fire hazard which, with others of similar physical properties, are denoted as Class A. This class also includes such "normal" combustible material as wood, paper, commodities other than inflammable liquids which are packaged in wood or paper, etc. Inflammable liquids belong to Class B; electrical hazards are Class C. The distinction between these groups rests primarily upon physical differences in connection with fire: a Class B hazard burns on the surface; a Class C hazard, if wet, makes an excellent conductor for electricity and thus may endanger life. Class A hazards are permeable; it takes time for water or other fire-fighting means to penetrate fur or wood or packed paper. Evidently, the amount of water or carbon dioxide gas necessary to assure quenching of flames or stopping of carbonization is greater than in the case of Class B or C hazards. In fact, where inflammable liquids are involved, it is a well-known fact that use of water may increase the danger by causing the flames to spread. Likewise, in the case of valuable Class A hazards such as furs or furniture or paintings, use of water would result in considerable damage and destruction. For these reasons, the use of carbon dioxide gas has been increasing, since this gas is non-injurious to property.

The use of carbon dioxide gas under pressure may bring to mind danger of walls collapsing under "pressure," but such is not the case. The gas, which is contained in cylinders under pressure and is released under high pressure under most carbon dioxide gas systems, is drawn off under controlled conditions by a vent system. Carbon dioxide gas may be used in par-

(Continued on page 44)

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guishing
f smoke
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Under-

High-ballin' Down the Main Pike or Pulling Out of the Tough Spots

EATON 2-Speed Truck AXLES

. . . give you the exactly-right gear ratio for every road, load, and type of service. There is no need to sacrifice speed for power—or power for speed. Eaton gives you BOTH—in the same vehicle with the same axle, available at finger touch to meet every specific operating need. And Eaton Axles actually pay for themselves, because they permit engines to operate at most efficient and economical speeds, reduce stress and wear on the entire vehicle, hold operating and upkeep costs to a minimum—and add miles to vehicle life. Eaton 2-Speed Axles are available for most trucks of the 1½ ton class and larger. See your truck dealer.

*More Than a Million
Eaton 2-Speed Axles
in Trucks Today*

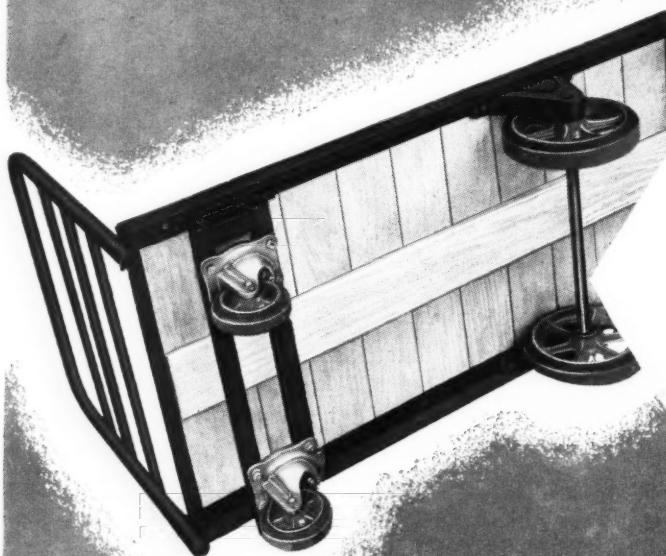


Axle Division

EATON MANUFACTURING COMPANY
CLEVELAND, OHIO

OTHER  PRODUCTS

SODIUM COOLED VALVES • POPPET VALVES • FREE VALVES • TAPPETS • HYDRAULIC VALVE LIFTERS • VALVE SEAT INSERTS • PERMANENT MOLD GRAY IRON CASTINGS • ROTOR PUMPS
SPRING LOCK WASHERS • SNAP RINGS • COLD DRAWN WIRE • HEATER-DEFROSTER UNITS • STAMPINGS • LEAF AND COIL SPRINGS • DYNAMIC DRIVES, BRAKES, AND DYNAMOMETERS



**STEEL
WHERE IT'S NEEDED**

**WOOD
WHERE IT'S NEEDED**

**FAIRBANKS STEEL-FRAMED
TWO-WHEEL TRUCK** is available in 28 sizes and types to meet specific job requirements



FAIRBANKS . . . Steel-Framed Trucks

● Your truck costs go down and your men get more done in less time with Fairbanks Steel-Framed Hand and Platform Trucks.

The reason is simple. Fairbanks has effectively combined the structural advantages of steel and wood to provide hand and platform trucks that stand up under all kinds of punishment in service . . . that have shock-absorbing qualities which cushion heavy loads, dampen vibration, reduce operator fatigue.

Like all Fairbanks Trucks (over 90 basic designs with hundreds of variations) each of these Steel-Framed trucks is developed from on the job experience to put the maximum speed and ease into specific types of load-handling. For example, the "Commander" Steel-Framed Platform Truck shown above comes in 20 sizes from 24" x 42" to 36" x 72", with 3 platform heights (18", 14", 9½") and Tilt or Non-Tilt running gear.

Full information on any one or the complete line of Fairbanks Trucks may be had from any of the offices listed below.

American Industry Rolls on Fairbanks Trucks

THE
fairbanks



COMPANY

520 Atlantic Avenue
Boston 10, Mass.

393 Lafayette Street, New York 3, N. Y.
15 Ferry Street
Pittsburgh 22, Pa.

746 M & M Building
Houston 2, Texas

202 Division Street
Rome, Ga.

Materials Handling

(Continued from page 30)

meetings with the materials-handling equipment manufacturers, has brought about a closer relationship and a greater appreciation of what the equipment manufacturers have to do for the warehousemen and what the warehousemen can do for themselves by being familiar with the various pieces of equipment that are available.

Again this year the number of warehousemen at the Materials Handling Exposition in Philadelphia shows that they are still vitally interested in further reducing their handling costs. While the fork truck and pallet system has done much to set up a uniform system, nevertheless, there are many instances where the use of conveyors has been overlooked, and where money can be saved by a proper study of materials handling operations within specific warehouses.

Many improvements have been made in construction of casters, wheels, and various types of floor trucks, and special trucks have been constructed for handling drums, rolls of paper and other special products. These important items should not be overlooked in the materials-handling picture, as there is hardly a plant, freight house, air terminal, warehouse, store or factory that does not have one or more hand trucks. However, many of these could be improved by simple addition of roller bearings in the wheels, the use of rubber tires, or possibly replacing an obsolete model by a better-designed unit of much more modern construction. Regardless of the heavy equipment that is used for materials handling, a certain number of hand-operated units are always required.

In other instances, the use of electric hoists and monorail systems would further effect savings, and thus is particularly true on special handling operations. Warehouses handling specialized materials such as steel pipe, structural steel members, have found it advantageous to employ mobile cranes, or to equip their fork trucks with crane booms for the unloading of gondola cars and for putting long

materials into storage racks. The accessories and attachments which are being developed for use on fork trucks and other mobile units are making it possible for warehousemen to utilize this same equipment on many of their handling operations whether they are able to utilize the palletized unit-load system or not.

Warehousemen who are also trucking concerns, especially companies who have to handle odd-shaped packages, overseas packages, and moving and rigging equipment, have all become materials-handling conscious, and they are utilizing more and more of this type of equipment in order to speed up the operation, thereby saving time and money on the job itself. In addition, they are making it possible to handle a greater number of loads in the same length of time with existing trucking and trailer equipment, rather than having to purchase new and expensive equipment for over-the-road service, in order to meet peak load operations.

Materials handling, in connection

with the subject of warehousing and trucking, is more than just the method of storing material. It covers the time and the method of unloading and loading barges, railroad cars, trucks, trailers, etc., as well as the transportation within the storage area, and the storing and loading out of the materials. In addition, savings can be made by utilizing the cube of the storage area, instead of just the square of the storage area, and while this fact should be apparent, it is necessary to stress it again, because it is frequently being overlooked.

Warehousemen themselves are now seeking better materials-handling methods, and there is no doubt that these new methods will be incorporated in any warehouse construction in the future.

The day of lifting by bull strength seems to be past in the American warehouse industry, and the manufacturers of materials-handling equipment will do well to listen to the demands of the leaders of this industry so as to be in a position to supply them with the proper type of equipment to meet their specialized demands, as well as their standard demands.

Hotpoint's New Program

(Continued from page 29)

Our experimental tests have caused us not to use pallets in the handling and shipping of our range crates. However, most of our incoming supplies for the making of our crates are palletized. This includes the hardwood strips, strapped in square unit loads with our standardized 42 x 48 in. pallet

strapped at the bottom of the pack, and another like pallet strapped in reverse at the top of the pack, thus enabling the palletized handling of the load whichever side may be upward. Also, we have the fibreboard sections for making the sides and ends of the crates for our electric-range units cut to exact size and shipped to us in palletized bundles. This method of packing and shipping involves some waste of space in rail-car or truck stowage, and we are obliged to return the pallets.

One of the final improvements now under way for the completion of our warehouse will be the finishing of an upper floor level at the entrance end of the building, to be utilized for office quarters. Here will be transferred the personnel for most of our traffic, billing, and shipping divisions.

Pallet Operations in "Country" Cold Storage Warehouse

In handling perishables, this "area of production" warehouse put fork trucks and pallets to very good use . . . Emulators must be prepared to make plant changes to provide facilities for loading and unloading and for fork truck maneuvering

By G. F. DODSON
Security and Cold Storage Co

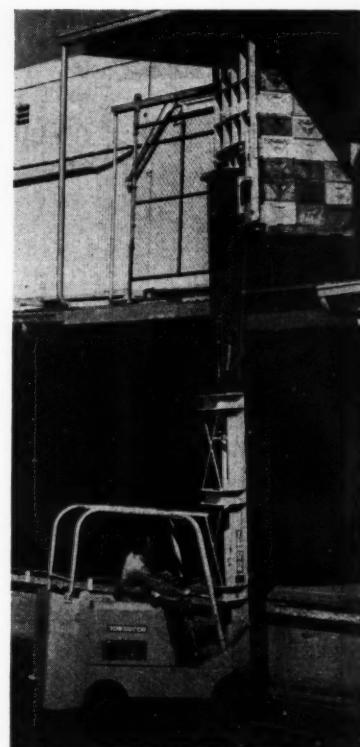
COLD storage warehouses have handling problems dependent to a great extent upon the type of business they handle. Broadly speaking, there are three types, namely, distribution warehouses where the storage goods are received mainly in carload lots and delivered in less than carload lots, storage-in-transit warehouses

where storage goods are received in carload lots and shipped in carload lots, and "area of production" warehouses where the storage goods are either stored in large quantities, each truckload containing part of several lots to be added to part lots in storage until each is built up to a carload lot for shipment at the end of the storage

period.

Our plants are "area of production" warehouses and the following discussion is pertinent to problems related to those of that type. Fortunately the types of structures and yard areas available enabled us to readily convert these plants to pallet handling operations. In order to facilitate the operation of fork trucks in the yards, two to three acres of good asphalt pavement were laid down. To serve the base-

(Continued on page 40)



WANT A

10-FOOT LIFT?

Get the telescopic *WORKSAVER* TILTING FORK ELECTRIC TRUCK



CAPACITIES:

2000 LBS.
up to 48" load length

2500 LBS.
up to 36" load length

3000 LBS.
up to 28" load length

Pallet loads, skid bin loads, loads with stringers attached—all can be piled high with this new 10-foot lift Worksaver. It gives you every advantage of available cubic footage in storage areas, in freight cars and motor trucks.

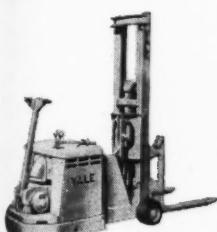
It's just the right truck for easy, fast and safe operation wherever clearances are low, wherever aisles are narrow. That's because it's only 83" high with forks lowered, and 33" wide. It lifts and travels by electric power. And the Telescopic Worksaver is rugged, powerful, economical to use. There's ample battery capacity for two days' operation without recharging.

So if you want to cut your production costs—if you want to put new speed into handling operations—the new Yale Telescopic Worksaver is the time, effort and money-saving electric truck for you. Get all the facts. See the classified section of your telephone book for our nearest representative or send for bulletin M-123. The Yale & Towne Manufacturing Company, Roosevelt Blvd., Philadelphia 15, Pa.

STANDARD MINIMUM HEIGHT: { 83" for factory and warehouse use
68" for freight car and motor truck loading

FREE FORK LIFT
60 1/4" on 83" high models
45 1/4" on 68" high models

Fork carriage elevates to minimum height before secondary uprights start upward. This "free fork lift" is an outstanding advantage because it permits stacking to greater heights where clearances are low and in freight cars and motor trucks. The Telescopic Worksaver is the only truck in its class that gives you this feature.



MATERIAL HANDLING MACHINERY

CUTS PRODUCTION COSTS...SAVES TIME...SAVES EFFORT...PROMOTES SAFETY

YALE



INDUSTRIAL SCALES • HOISTS — HAND AND ELECTRIC • TRUCKS — HAND LIFT AND ELECTRIC

Truckloads

(Continued from page 25)

and unreasonable."¹⁷

"I'll agree, though," continued McCormack, "that a minimum weight should not be maintained in excess of what can be loaded in the equipment normally used by motor carriers or that can be transported legally.¹⁸ This situation has had the attention of the Commission in several decisions among which are coffee from Jacksonville, Fla., to Nashville, Tenn., 34 M. C. C. 625 (627); shoddy lining between Southern Mo., and Southwest, 33 M. C. C. 513 (515); canned goods, E. T. L. Territory, to Ga., N. C., and S. C., 32 M. C. C. 645 (658); sugar from Colo. to Kans. and Mo., 42 M. C. C. 161 (167)."

"Last week we received a consignment weighing 6000 pounds. On a lot that heavy, shouldn't the carrier give us a truckload rate?" Flanders remonstrated. "Or, it seems to me, that parcel could have been handled as part of a truckload lot. On each of the following two days, deliveries of the same kind of material were made to us by the same truckman from the same supplier. The total weight of the three lots equalled the truckload minimum."

"Rates on such quantities as 6,000 pounds ought to be sufficiently higher than on full loads to compensate for the additional expense and labor of handling the small shipments," McCormack commented.¹⁹ "As to your further observation relating to the three consignments, moving truckloads in part lots opens the door to abuse.²⁰ A shipper might easily tender part of a truckload shipment for transport at the truckload rate, with the promise of the balance at some other time, thus receive less than truckload transport at truckload or volume rates. All rates subject to minimum weights should be restricted to apply only when the shipments which equal or exceed the minimum weight are actually tendered for transport from one shipper and are transported from one point of origin in one day and on one bill of lading, subject to any tariff provisions

allowing split pick-up or partial loading in transit."²¹

"In the event we received or shipped a less than truckload consignment which filled the entire space of a motor truck, should we not have the benefit of a truckload rate?" Flanders demanded.

"By no means," McCormack stated. "An carrier's rule that when a less than truckload shipment fully occupies the loading space of a vehicle, charges no less than on the basis of 10,000 pounds at the applicable rate should be collected, but not to exceed the charges for a truckload of the same commodity based on truckload rates and minima, is unlawful, since it would apply regardless of size of the vehicle."²²

"Couldn't we work out some sort of arrangement with a trucker whereby the amount of packages per truckload would govern the charges, rather than bothering with the issue of weight?" Flanders urged.

"A similar plan already has been tried by some truckers," McCormack pointed out, "but the Commission told them to revise their tariffs. A minimum weight rule making final determination of the charges depend upon displacement of goods transported, although means of determining actual weights may be available at origin, goes beyond authorization for use of constructive weights."²³

"By the way," Flanders interjected, "can a trucker refuse to accept for transportation articles of unusual size and weight?"

"To be sure," replied McCormack, "but the trucker should so specify in a published rule which is clearly understandable. A rule providing for nonacceptance of 'articles which because of their size and weight cannot be placed in carrier's equipment' is indefinite, as carriers can publish a provision stating the maximum size and weight of articles which can be transported in the equipment they operate."²⁴

"In view of the fact that we, as well as other consignors, ship products taking various classification ratings, might it be possible to secure a rate on mixed truckloads?" Flanders persisted.

"Yes," stated McCormack. "Maintenance of an appropriate mixed-truckload rule by a carrier may be authorized, provided the service is confined to a movement from one consignor to one consignee.²⁵ On the other hand, authority to transport 'truckloads' may not be properly construed as embracing the right to handle a load mixed or straight, consigned to a number of different consignees, since in that event the consignor would be receiving less than truckload service in respect to each of the separate consignments."²⁶

"In considering a proposition for a reduction in a truck rate, which is of greater significance, weight or value?" Flanders asked.

"The weight per cubic foot is a more important factor than the value per pound," said McCormack.²⁷ "This applies with even greater force to commodities transported by motor than by rail carriers, in view of the smaller capacity of their equipment."²⁸

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"No police chief alone can break that jam, Mr. Mayor —this town needs a top-notch traffic engineer!"

America must find room for more than 40 million cars and trucks—and that's no easy job!

THIS police chief is right. It takes more than *his* badge of authority to speed the flow of traffic and eliminate congestion.

What his city needs is a practical, intelligent plan—with adequately trained men to carry it out—and plenty of co-operation from the public, of course.

No mayor or city manager, and no group of public spirited citizens alone, can possibly decide by themselves how to end traffic snarls, delays and accidents.

The problem demands thoroughly professional study and diagnosis—and more and more municipalities are now beginning to recognize this.

Steps in the right direction

They've taken steps in the right direction in Milwaukee, Detroit, Den-

ver, Seattle, Buffalo and Dallas, to name just a few places.

These cities—and numerous others—are giving their police departments the continuing help of experienced, competent, resourceful traffic engineers—men who know how to get results with a minimum of public inconvenience.

Sound planning gets results

In Detroit, the result has been to speed vehicle movement considerably—with a 50 per cent decrease in accidents!

Milwaukee has been made one of the safest cities in the country.

Any community can effect comparable improvements in its traffic set-up, if sensible, feasible programs are adopted for better use of its present streets.

What traffic conscious America needs is not more restrictions on its cars, trucks and buses, but more up-to-date methods of routing them in everybody's best interest.

New safety for pedestrians as well as vehicle occupants is usually the result of smoother traffic flow. In fact, the record shows that almost every measure which reduces street congestion also reduces accidents.

As a nation-wide observer of what competent traffic management can accomplish, Studebaker feels that there's virtually no limit to the progress that can be made.

STUDEBAKER

**AMERICA'S GREAT PROGRESSIVE IN
TRANSPORTATION SINCE 1852**

© 1949 The Studebaker Corp'n, South Bend 27, Indiana, U.S.A.

PALLET OPERATIONS

(Continued from page 36)

ment at the Santa Clara plant, a ramp about 115 feet long with about an eight percent grade was constructed. The head of the ramp opens onto a spacious, paved yard. Fig. 1 shows the ramp.

All outside loading and unloading operations are performed with gasoline powered fork trucks. All the inside operations are performed with electric battery powered fork trucks, supplemented by electric pallet jacks used only for transportation purposes. Canopies have been erected in the yards so that merchandise unloaded can be set back during heavy receiving periods and so merchandise to be delivered can be accumulated and made ready for shipment. These canopies function as reservoirs and the stacking and unpiling crews can work steadily throughout the day irrespective of the peak receiving or delivering periods. This reduces the number of men and the fork trucks needed, provides better service to customers, and cuts down the handling cost.

The San Jose plant consists of two stories and a basement. The second floor level is about 17 ft. above the yard level and a second floor platform was constructed flush with the outer edge of the truck platform. A high masted fork truck was obtained for unloading and loading operations, and all pallet loads of merchandise destined to or from the second floor, from or to the highway trucks are

handled by this equipment. This eliminates several handlings required when using the elevator and it costs little more and is little less convenient to operate the second floor than the first floor. Fig. 2 shows the use of this second story platform.

Discussion will be limited to two principal "area of production" products handled; namely, fruit in field lugs and packed pears. Lug boxes measure 24 in. long, 15 in. wide and 9 in. deep, including end cleats. A special pallet is required measuring 45 in. wide and 48 in. long. The 48 in. length has a special significance because it allows the loading of two pallets opposite each other on the bed of a 96 in. maximum legal width highway truck. All fruit in field lugs is loaded on customer owned pallets in the orchards or at the canneries for storage. Fig. 3 shows the type of pneumatic fork truck used in some large orchards. The standard pallet load of lug boxes is six stacks, seven layers high and weighs about 2400 lbs. including the pallet.

The highway truckloads of fruit in field lugs are driven into our yards and parked out away from the platform, and the unloading is accomplished in a very few minutes by fork trucks. The pallets are set on the truck platform for first floor storage, lifted to the second story platform at the San Jose plant for second floor storage or

carried into the basement via the ramp for storage at that level at the Santa Clara plant. Depending on ceiling heights, the fruit is stacked two and three pallets high. Where the stacks are three pallets high, a special high lift attachment is required because the masts are only 83 in. high to allow passage through our 84 in. doors.

To use the maximum space in cold storage rooms, there is a certain amount of building up or tearing down of layers of lug boxes on pallets. This happens even in rooms originally built for standard loads. Highway trucks vary considerably in the height of loads depending upon the capacity rating of the truck and the type of fruit carried. Then, too, not all room heights are suitable for so-called standard pallet loads. This building up and tearing down increases the cost to some extent, but still is a great saving over the old hand stacking. Deliveries of fruit in lugs are also made to highway trucks and the operation is just the reverse of receiving and storing, except the truck driver adjusts the height of his load if it is important to him.

Considerable experimentation was required to find the best means of hauling, storing, handling and loading packed pears on pallets. Highway trucks require pallets four ft. long because the bed of a truck is eight ft. wide, and since it was desired to receive all packed pears from the packers already loaded on pallets, the length of the pallet definitely had to be four ft. All packed pears are eventually shipped in refrigerator cars which mostly have narrow doors, too narrow to accommodate pallets four ft. wide or even 45 in. wide, such as the lug box pallet. It was also found that the only flat surfaces on a pear box were the two ends, and if they were stacked on any other surface without strips, the pears would bruise over a long period of storage. So it was decided to stack the pears on end without the use of strips. A pear box is about one ft. wide, so the width of the pallet was finally set at three ft. Thus the pallets are four ft. long and three ft. wide and hold three layers

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BAKER FORK TRUCK



BAKER HIGH LIFT PLATFORM TRUCK

Time Savers, Cost Cutters

Battery Electric Trucks and EXIDE-IRONCLAD BATTERIES

Handle materials the modern way . . . the fast, safe, economical way. Use versatile battery electric trucks for loading, unloading, hauling, high tiering. They'll help you speed production, open up bottlenecks, save and earn for you all along the line. When powered by dependable Exide-Ironclad Batteries, you can count on full shift availability day after day, year after year.

Different from all other batteries in construction as well as in performance, the Exide-Ironclad possesses ALL FOUR of the essential characteristics demanded of a battery for electric industrial truck service—(1) high power ability, (2) high efficiency, (3) great ruggedness, and (4) long life. These characteristics are due to the special construction of the Exide-Ironclad Battery, especially its rugged, tubular positive plate.

Write for further particulars and FREE copy of Exide-Ironclad Topics, which covers latest developments in materials handling and shows actual case histories.

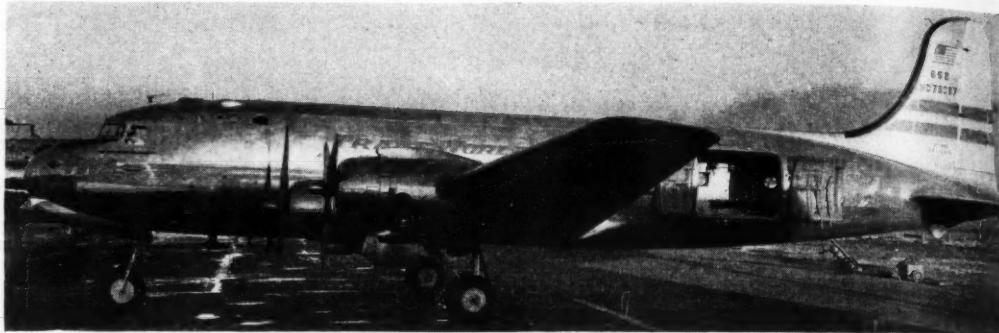
1888...DEPENDABLE BATTERIES FOR 61 YEARS...1949
"Exide-Ironclad" Reg. Trade-Mark U. S. Pat. Off.

DEPENDABLE POWER



THE ELECTRIC STORAGE BATTERY COMPANY
Philadelphia 32

Exide Batteries of Canada, Limited, Toronto



Proper Pay for Air Forwarders

Forwarders should be paid on a commission basis . . . At present, they thrive on the spread between rates for large and small shipments, but this spread does not reflect actual costs . . . A change would result in lower aircargo costs, higher returns to the air lines and greater carrier freedom to experiment with volume rates.

By JOHN H. FREDERICK, *Aircargo Consultant*

WHEN the CAB decided to permit freight forwarders to enter into air cargo transportation it carried over into the air two characteristics of rail forwarding which seem to be causing some trouble. These were the activities of consolidation and operation on the spread in rates between large and small shipments, the latter being similar to traditional forwarder operation between I.c.l. and c.l. in rail transportation.

In its minimum rate order of last July, the Board spoke in general terms of savings in unit costs to carriers in transporting heavier shipments but did not offer convincing arguments as to the extent of such savings. The differential authorized by the Board between the 16¢ ton-mile rate and the 16/13¢ rate for shipments in excess of 1,000 ton-miles, was not stated as reflecting the cost savings either from increased weight of shipment, increased distance of shipment, or any combination of both factors. In the Air Freight Rate Case one of the non-certificated carriers, in support of the savings in cost it claimed to experience in the handling of heavier shipments, listed some 34 procedures which it was

said had to be performed on every shipment regardless of size. As a matter of fact, many of these procedures must be performed on each piece carried so that in handling a whole consignment consisting, say, of 20 pieces, such as might be tendered an airline by a forwarder, many procedures would be performed by the carrier not once but twenty times.

It seems that one of the difficulties in the whole situation as between the CAB, the air carriers and the forwarders, to say nothing of the shippers, has been the misleading use, at least as far as air cargo is concerned, of the terms "volume shipment" or "consolidated shipment." These terms carry the implication of a single heavy consignment in contrast to many small packages. But this is not the case in air transportation. The consolidation which the forwarder has proposed in support of applications for CAB certification is not a physical consolidation as has been the case in connection with rail transportation. What a forwarder tenders to an air carrier as a volume shipment of say 3,000 pounds will consist of many small packages with the total weight of

3,000 pounds, perhaps as many as 100 separate pieces. Under airline tariffs such a shipment is a single shipment, but contrary to the ground transportation practice where I.c.l. shipments are consolidated into c.l. shipments, the air carrier must handle each package individually except that only a single way-bill need be prepared. In fact many air carrier tariffs provide that when a real volume shipment is tendered, that is in a single piece weighing, for example, 3,000 pounds, rather than a discount, a premium charge is made even though all the 34 procedures required for a single shipment need, in this case, be performed only a single time.

The division of line-haul revenues between the forwarder and the underlying carrier which comes about when the spread is used as a basis for forwarder compensation will produce three consequences, none of which will be likely to contribute to the development of air cargo: (1) Notwithstanding the low volume rates offered in a carrier's tariff, the public will continue to pay a much higher rate for its air transportation. This, of course,

(Continued on page 58)

ALONG THE WAY...OF TWA



TWA MAKES THE FUR FLY

DOMESTIC FUR BUYERS DEMANDED STONE MARTENS IN A HURRY. EASIEST, QUICKEST WAY TO GET THEM WAS VIA **TWA** AIR CARGO. SHIPMENTS LEFT PARIS ONE DAY...ARRIVED IN U.S.A. THE NEXT. SIMPLIFIED PACKING, TOO.

WHAT'S YOUR PROBLEM?

WHENEVER YOU HAVE A "RUSH" SHIPMENT...CALL **TWA** (SEE PHONE BOOK). AIR CARGO AGENTS GLADLY ANSWER QUESTIONS...HELP ROUTE SHIPMENTS BEST WAY.



KEY TO TREASURES

LOCK AND KEY GUARD VALUABLES ON **TWA** INTERNATIONAL ALL-CARGO FLIGHTS. THEY'RE CARRIED IN TON-SIZED "STRONG BOX" BUILT INTO FUSELAGE OF PLANE. FLIGHT CARGO AGENT ON EACH TRIP.



MILWAUKEE BEER "HOPS" TO CEYLON

RECENT MILWAUKEE BILL OF LADING DECLARED: "TWO BOTTLES OF BEER...DESTINATION CEYLON." GIFTS VIA **TWA** AIR CARGO GET THERE QUICKLY...SAFELY. YOU CAN SHIP ALMOST ANYTHING THIS EASY WAY.



SHIPPING THE WAY OF TWA...SAVES ON INSURANCE

WHY? BECAUSE SHIPMENTS ARRIVE SOONER. OVER-ALL RATES (EVEN WITH MORE EXTENSIVE COVERAGE)

TOTAL LESS THAN FOR SURFACE SHIPMENTS.

SET THE TIME

TWA reserves space for your shipment at any time you say. Big, 4-engine, All-Cargo planes handle international shipments on frequent schedules. There's no delay via TWA, and rates are lowest in TWA history.



DIRECT SKY ROUTE TO MAJOR MARKETS

TWA Air Cargo flies high, fast and direct to Europe, Africa, Asia...with no off-line handling. Facilitates shipping. Call TWA today, or...if shipment is for overseas...any international freight forwarder can also give you complete information.

TWA

TRANS WORLD AIRLINE

U.S.A. • EUROPE • AFRICA • ASIA

WHY HAVE FIRES

(Continued from page 32)

titioned enclosures, so long as these are relatively air-tight.

The Underwriters' Laboratories, Inc. approved C-O-Two System consists of three elements: a smoke detection, heat detection and fire extinguishment setup which is integrated within itself and with the building or ship in which it is installed. The system may either be fully automatic, or manual controls may be provided for. Since the system relies to a considerable degree upon the detection of actual or incipient fire before it has a chance to do much damage, attention ought first be given to the smoke detection device. This is a compact unit with intake and electronic device which draws in air at all times. Circulation of the air is gentle and there is no danger of increasing the availability of oxygen to flames. Since smoke generally occurs prior to active combustion, and particularly in the case of Class A hazards, the device provides timely warning in all cases

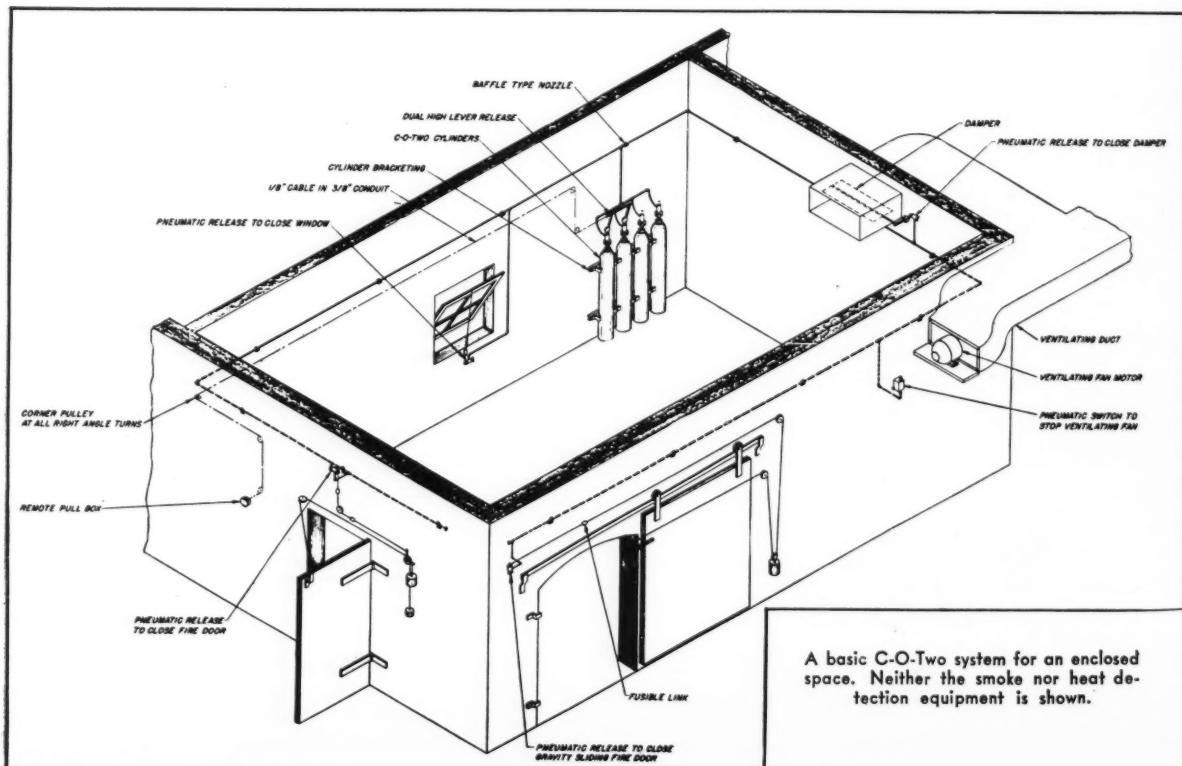
where smoke occurs in even the slightest degree. In those cases where some dust is present and may be drawn up to the electronic device, there is no danger of a false alarm; dust particles are distinctly larger than smoke particles and a filter keeps the larger particles out of the device itself.

Heat detection devices are of three types: direct thermal, automatic electric, and "rate of rise release." The first is used for small hazards. The "rate of rise release" may be electrical or mechanical. The cost of both the heat and smoke detection devices is, of course, secondary to the cost of piping and mounting of the cylinders (including the cost of the carbon dioxide gas cylinders themselves). This may be stated as follows: on small jobs, the cost ratio of piping to thermostatic and smoke controls is low; on larger jobs the ratio increases. This is because only one heat detection device is required in a room, whatever its size. In large rooms, the

amount of piping will be greater.

Since the amount of space determines, generally speaking, the amount of stored carbon dioxide gas and piping required, the degree of utilization of the protected room has no bearing on the installed system. In fact, when a system is installed, provision of piping, carbon dioxide gas and other devices is on the basis of the total cubic feet enclosed, and not on whether the room will be half or one quarter used. Merchandise may then be stored in any quantity. It must be borne in mind that, in the case of such commodities as baled paper, common sense will dictate to the warehouseman that provision must be made for employes' safety by allowing sufficient walking space and keeping material away from the various devices installed. Compactness of stored merchandise will also be a factor to be considered, since (in the case of baled paper) storing it in huge masses will reduce the penetration of carbon dioxide gas. This would, of course, be also true of water.

The illustrated diagram shows the basic carbon dioxide setup as installed in a typical room. Pipes



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are external; where the system is to be installed in a building under construction, it is feasible and sometimes desirable to have most of the piping inside the walls. However, in view of the negligible maintenance required for the pipes (in contrast with water pipes for sprinkler systems where corrosion may take place), the question of internal or external piping is a matter of convenience and appearance rather than of efficiency or cost.

In most cases, it is desirable to have a supplementary battery of carbon dioxide cylinders in case a second emergency occurs before the main battery can be refilled. This is called a "double shot" and is insisted upon by certain fire insurance companies. This reserve cannot be considered as a replacement for the primary battery of containers; these must still be recharged. Refills cost about five dollars per cylinder.

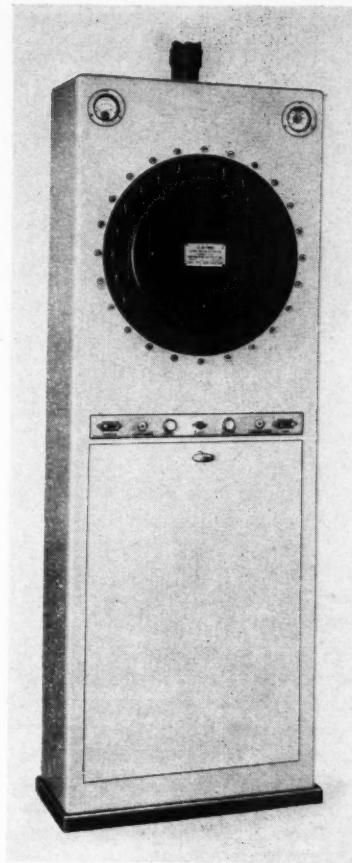
In the case of warehouses where it is desired to install a carbon dioxide system, as for example in beet seed or flour warehouses where water damage due to a sprinkler system might mean total loss to merchandise, it is desirable to subdivide the warehouse space into smaller units. This increases the speed with which the detection devices may pick up smoke or heat. This can be done by using masonite or similar material and making it relatively airtight. This problem does not usually arise on ships since modern vessels are well compartmented. It might be mentioned, in passing, that the Maritime Commission insists on carbon dioxide fire systems for subsidized ships; both the American Bureau of Shipping and the Coast Guard recommend this practice.

On the system being set into motion by the presence of smoke or heat, an alarm is immediately sounded. In automatic setups, a given time is allowed employees to leave the affected room before doors are shut and the carbon dioxide gas is discharged. In the case of manual controls, the elapsed time is flexible. About 30 minutes are allowed for the carbon dioxide gas to take effect in the case of Class A hazards. A major advantage of the carbon dioxide system is the fact

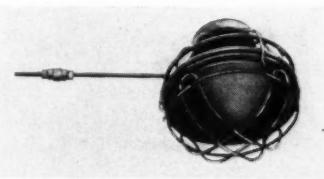
that only the employees of the affected room need leave; employees in other parts of an establishment may remain at their place of work.

A second advantage of the system is that its speed and efficiency generally keep total damage low. This damage level has another important function: litigation or negotiation over salvage value is minimized. In the case of sprinklers, water damage may, and often does, run into thousands of dollars, and much time is consumed determining what the net loss is.

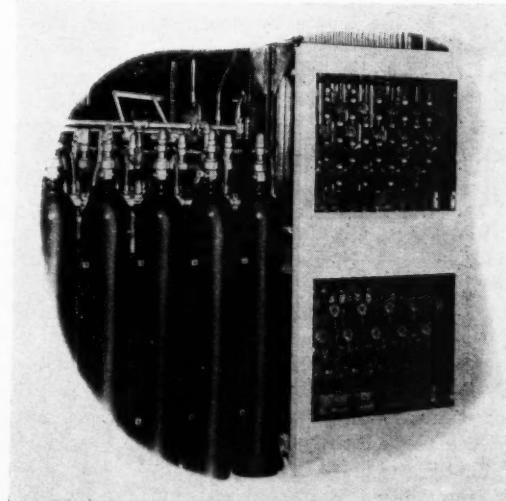
While a limited number of warehouses have so far installed a carbon dioxide gas system, it is important to note that Boston Storage Warehouse Co., one of the largest in the country, has invested in a C-O-Two system in order to obtain adequate and efficient protection. This protection is offered, not because of the high value per item of the stored goods (several agricultural commodity warehouses are now so protected) but because of the many advantages offered by the system which are not available under other type systems.



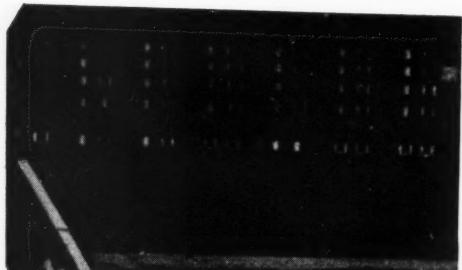
C-O-Two smoke detecting cabinet located at the main fire station.



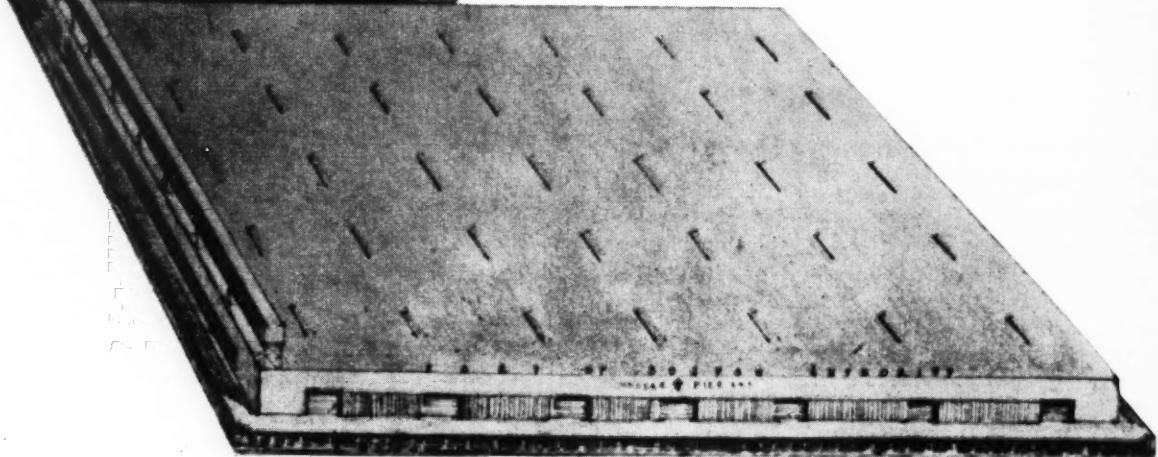
One of the rate-of-rise heat detectors located in the fur storage vaults



C-O-Two control valve cabinet located next to the C-O-Two cylinders



PROGRESSIVE P



Hoosac Pier No. 1, now under construction on the Charlestown waterfront, can berth three large vessels.

THE Port of Boston does not enjoy the measure of the blessings bestowed by nature and man on such ports as New York, Philadelphia or New Orleans. It is the door to a much smaller industrial-population area than other ports and does not have that complex of rail termini and canals or adjacency to heavy and light industry such as Philadelphia and other ports enjoy. Nevertheless, it has other advantages: proximity to Europe, a hinterland populated by several million energetic souls, a respectable concentration of industry and nearness to Canada and the Metropolitan New York area. Its major weakness is a hinterland lacking raw materials such as coal and iron ore. A major oil pipeline stops short near New York; the Erie Canal ends in New York; much of New England is forest land; and upper New York State cuts New England off from the St. Lawrence. For these and other reasons, while other ports have been progressing by leaps and sometimes by bounds, the Port of Boston has lagged behind.

Lastly, the defense requirements of the United States at present

stress western and southwestern development, not the development of more vulnerable areas such as the extreme northeast.

The weakness of the rail position of Boston is illustrated by the fact that hauls from major industrial areas in the midwest are greater to Boston than to either New York or Philadelphia. Further, barge transportation of coal from the Virginia termini of the Pocahontas railroads is much longer than to New York. This adds to coal costs and has encouraged New England to use greater quantities of fuel oil.

In contrast with the above major disabilities, Boston has an excellent harbor and some advanced handling and other waterfront facilities. The city is also the center of a manufacturing area which produces such variegated products as shoes, ammunition, paper products, time pieces, bolts and nuts, and boats. There is no question that more intensive modernization of the port and nearby areas would further attract industry, as well as promote heavier utilization of the harbor area.

In order for the Port of Boston to maintain its position as one of

the major ports in the United States, it must have modern facilities for the accommodation of vessels and their cargoes. The Legislature of the Commonwealth of Mass. contemplates an expenditure of approximately \$19,700,000 for the acquisition and modernization of the port terminal facilities.

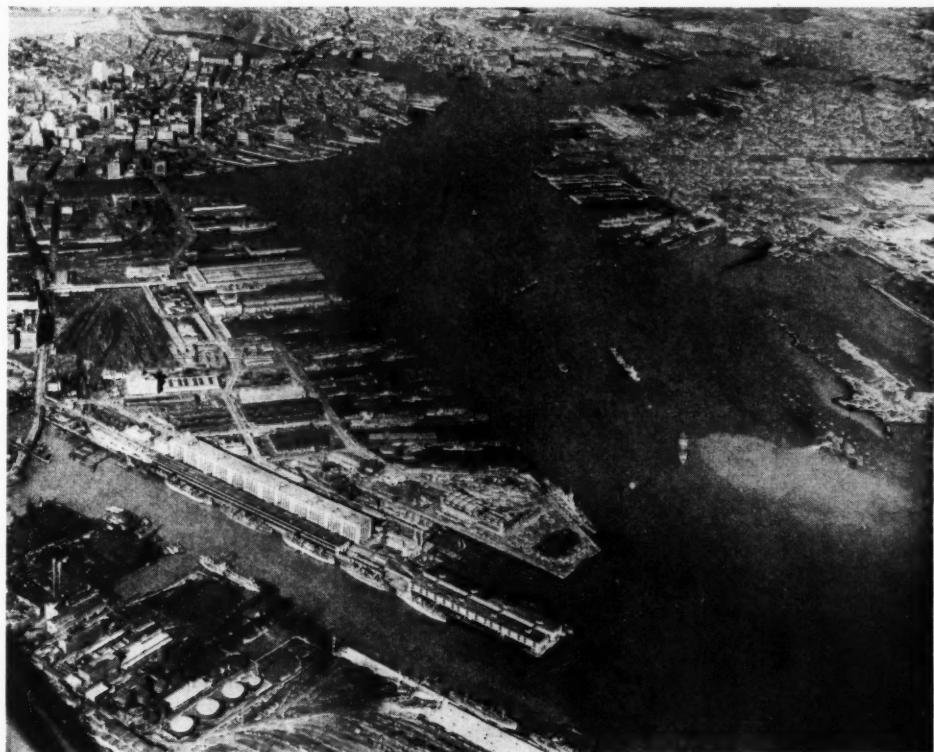
The initial step in this program is the construction of the new Hoosac Terminal which is close to 50 per cent complete. An agreement between the Port of Boston Authority and the Boston and Maine Railroad Company provides for the purchase of the site and the leasing and operation of this pier by the railroad company upon its completion. The total estimated cost of this project including purchase of the property and the modernization of the grain elevator is approximately \$4,000,000.

The new terminal now under construction extends approximately 540 feet from shore and is 512 feet wide, with single story transit cargo shed. The two sides of the pier will have working aprons 25 feet wide, each with one track flush with the deck. The end berth

(Continued on page 104)

IVE PORTS . . . this month BOSTON

Strategically located areas of the Port of Boston are undergoing improvements designed to supply commerce with more modern facilities . . . Much of the work on docks, storage facilities and roadways is being pushed to completion and one of the oldest but potentially greatest of U. S. ports is successfully meeting the challenge posed by other progressive ports.

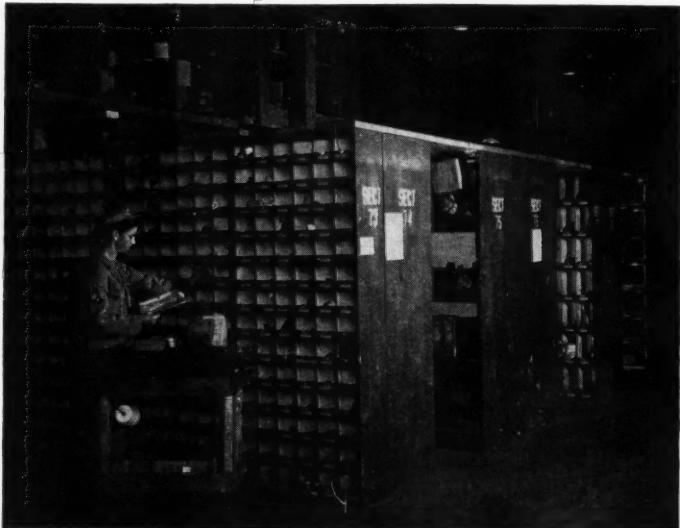


The wide, but protected inner harbor is shown in this aerial photograph. In foreground is a corner of Castle Island Terminal, with the Army Base across the Reserved Channel. Moving in a clockwise direction, we see the South Boston waterfront, with Commonwealth Pier and the Fish Pier; in the background, the Charlestown waterfront, with the entrances to the Charles, Mystic and Chelsea rivers, and on the upper right, the East Boston waterfront, with the Boston and Albany Piers.



The vast Castle Island Terminal, with berths for seven vessels and acres of space available for open storage and industrial development.

Government Warehousing



SIGNAL CORPS
U. S. ARMY

The Bureau of Federal Supply, the Army's Quartermaster Corps, and the Navy, the government's three chief storage and warehousing agencies, will have to work overtime to meet the needs of U. S. policy. They have the equipment, the know-how, and the organization to fill the bill.

By ARNOLD KRUCKMAN
Washington Correspondent

THREE is little doubt that Congress will allow the armed services at least fifteen billion dollars, and possibly twenty billion dollars, for the fiscal year 1949-1950. It is further expected that between six billion and ten billion dollars will be appropriated for the re-arming of western Europe. How much will be set aside for the Economic Cooperation Administration in the next budget is not yet clear. The initial undertaking involved six billion dollars. The next operation will scarcely require less.

Obviously, the enormous transfer of materials resulting from such expenditures will require expanded facilities for storage and warehousing. Added emphasis was recently placed upon the role which storage and warehousing must play in efforts to carry out this nation's policies, when the Office of Transportation and Storage was created in the purlieus of the National Se-

curity Resources Board. Directing the mobilization of storage and warehousing resources is Capt. Granville Conway, who was widely known to storage people during the war. The major share of the effort will have to be carried by three main groups: The Bureau of Federal Supply—a civilian agency—the Army's Quartermaster Corps, and the Navy.

A detailed report of the actual extent of the government's warehouse and storage facilities cannot now be made. It may be stated, however, that the BFS has highly organized, efficiently administered facilities in 12 major centers, as well as sub-warehouses in other sections. Its warehouse at its central headquarters in Washington, D. C., exemplifies the facilities available in other parts of the country. It is located in the same building in which the bureau, the government's civilian nerve center in

the procurement and distribution network, transacts its regular business. This concrete and steel structure, five floors of which are devoted to the warehouse facilities, occupies more than a city block. Virtually every type of merchandise and material handled by civilian government agencies is stored here. The warehouse is equipped with every modern facility, including switch engines and sidings. It has its own vehicles for delivery. This and other BFS warehouses are among those now serving ECA.

ECA is getting additional aid from the Quartermaster Corps, although most of the services rendered by QM must be devoted to Army needs. Again, no detailed account of facilities may be published (Pentagon refers to this information as "classified"), but a general survey is "in line."

(Continued on page 66)

Field Warehousing

(Continued from page 19)

the event that the distributor meets with financial difficulties, the receipt holder can demand delivery of the balance of merchandise held on warehouse receipt.

It is fairly common practice for large mail order houses to place sizable seasonal orders for stoves, dolls and other items with the understanding that delivery is not to be made until requested. The manufacturer eventually has considerable working capital tied up in finished goods in his inventory storage facilities; before the advent of field warehousing he was forced to seek other means to obtain additional capital to continue operations. Now, the solution is the use of field warehousing with the warehouse receipts issued in the name of the mail order house. Goods are held in the field warehouse until needed for the seasonal trade.

Field warehousing is a rather adaptable industry that can in most cases be modified to meet the particular needs of its user. Through the years, it has proved itself to be a valuable part of commercial activity, and demands on this industry are increasing as its many uses become apparent to business concerns.



Geo. McQueston Co., Inc., specializes in heavy timber and planking for fishing boats, ocean going tugs and other wooden vessels. Here their three Lorain Self-Propelled Cranes, designed to handle heavy loads, serve this extensive yard unloading and stockpiling lumber. The Shovel Co., Lorain, Ohio.

\$5.07 saved a contract ...and a man's business



Special switches were needed to complete an electrical instrument contract. Late delivery of finished items would kill chances of future orders and lay off men. Switches were 1100 miles away, but Air Express delivered the 15-lb. package at 3 A.M. — 8 hours after pick-up. Cost, only \$5.07. Air Express now used regularly. Keeps down inventory, improves customer service by early delivery.



Low as \$5.07 was, remember Air Express rate included door-to-door service, receipt for shipment and more protection. It's the world's fastest shipping service that every business uses with profit.



World's finest Scheduled Airline fleet carries Air Express. 24-hour service — speeds up to 5 miles a minute. Direct to over 1000 airport cities; air-rail for 22,000 off-airline offices.

FACTS on low Air Express rates:

17-lb. carton of hearing aids goes 900 miles for \$4.70.
12 lbs. of table delicacies goes 600 miles for \$2.53.
(Same day delivery in both cases if you ship early.)

Only Air Express gives you all these advantages: Special pick-up and delivery at no extra cost. You get a receipt for every shipment and delivery is proved by signature of consignee. One-carrier responsibility. Assured protection, too—valuation coverage up to \$50 without extra charge. Practically no limitation on size or weight. For fast shipping action, phone Air Express Division, Railway Express Agency. And specify "Air Express delivery" on orders.

SPECIFY AIR EXPRESS



GETS THERE FIRST

Rates include special pick-up and delivery door to door in principal towns and cities



AIR EXPRESS, A SERVICE OF RAILWAY EXPRESS AGENCY AND THE
SCHEDULED AIRLINES OF THE U.S.

Marine Refrigeration

(Continued from page 23)

Valuable experience was gained during World War II regarding the care of perishables in ships' stores. Serious spoilage of foodstuffs resulted in a directive being issued in the closing years of the war by the War Shipping Administration, requesting a reduction in high box temperatures. All post-war vessels now specify lower temperatures. The S.S. "Excalibur," one of the "Four Aces," recently converted and now on her return from her maiden voyage, is provided with ships' stores compartments capable of maintaining 0 deg. F.

Ships' stores plants are usually designed for direct expansion, Freon-12. A few installations on passenger vessels have employed brine circulation when equipped with cargo refrigeration also using brine. With very few exceptions, Freon-12, motor driven, reciprocating compressors are employed, with shell and tube sea water condensers. The size of the refrigerating plants varies from 3 to 5 h.p. for small vessels, to over 100 h.p. for superliners similar to those recently proposed for the U. S. Lines. For the smaller plants one compressor is furnished, with complete standby as a spare. On the larger plants, it is usually desirable to furnish two or three compressors to carry the load and one additional compressor as a complete standby. Where cargo refrigeration or air conditioning is included, it is sometimes possible to arrange the installation so that one compressor serves as a standby for all three plants.

Evaporators for ships' stores compartments fall into three categories:

1. Air coolers, usually of ceiling suspended type, for temperatures of 35 deg. F. and above.
2. Prime surface coils for compartments maintained below 35 deg. F.
3. Plate type evaporators.

Only recently have plate type evaporators been installed on shipboard. They are usually arranged so that the plates form shelving which makes it particularly appli-

cable for quick frozen food which is packed in uniform cartons.

Cargo Refrigeration is more complex inasmuch as the ship owner requires an installation to provide sufficient flexibility to carry any type of perishable cargo and capable of maintaining any temperature from -10 deg. F. to +55 deg. F. Except for the completely refrigerated ship, most refrigerated cargo vessels are provided with multiple compartments accessible through doors leading to the hatch and confined to 'tween deck spaces. The compartments vary in number and size depending upon the requirements of the trade.

Cargo High Side

The High Side equipment usually consists of multiple reciprocating Freon-12 compressors. In the case of some of the more modern installations where the tonnage is sufficiently large, Freon-11 centrifugal refrigerating machines are used.



Yale & Towne Mfg. Co., Philadelphia Division, is introducing the "Lift King", first of a new line of gas fork trucks. This truck, now in production, comes in a few sizes up to 8,000 lb. capacity. Speeds with or without loads are 7 to 9 m.p.h.

The 5,000 lb. capacity model weighs 8,400 lbs. and like other models has a novel feature: a fluid drive. Other details include hydraulic lift, a single piston (ram within ram), automotive-type controls, a Chrysler-type motor and rear-end exhaust.

The value of a single cargo often exceeds the cost of the entire refrigeration plant. Accordingly, regardless of the number of compressors required to carry the load, at least one compressor is provided for complete stand-by.

Electric motors are predominantly used with reciprocating compressors. Steam turbines have been applied to good advantage on centrifugal machines which are particularly adapted to this method of drive, since its operating speed varies from 4,000 to 8,000 r.p.m. Until recently, Freon-12 reciprocating compressors were driven through multiple V-belt drives. Today, compressors are designed to operate at 1,750 r.p.m., making direct connection to motors possible, thus resulting in a substantial decrease in space and weight.

Cargo Low Side

In the case of cargo refrigeration, there are several types of low side equipment employed, the most widely used design being known as the diffuser system. This consists of a fan coil assembly, either of the factory self-contained type or the built-up type. Extended surface cooling coils are commonly employed due to the savings in space and the reduction of refrigerant charge. Defrosting is most effectively accomplished by sea water spray for direct expansion systems and in the case of indirect systems, it is the usual practice to circulate warm brine through the coils.

A second method is known as the wall coil type. This consists of zig-zag or hair-pin prime surface coils installed along the walls of the compartment enclosed in a solid baffle running from deckhead to the floor gratings. A sheet metal duct provided with bottom slots is run around the periphery of the walls above the cooling coils.

With banana cargo, a third type of system is preferable. This system is identical to the diffuser system except for the means of air distribution. A solid baffle or apron, as it is sometimes called, running from deck to deckhead, is constructed around the periphery of the compartment. Adjustable air outlets are provided both along the

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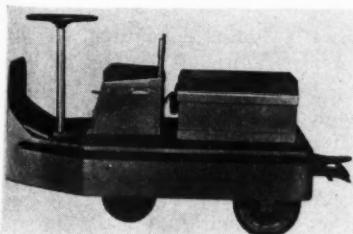
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Pallet Operations

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of 12 boxes each, stacked on end. Packed pears three layers high stacked on end were found to be quite unstable when transported or stacked. To cure this difficulty, packers were furnished with heavy sisal twine cut in proper lengths with a loop in one end and asked to tie a rope around each of the two top layers on each pallet. They found this easy to do and all pallet loads come to us ready to stack.

Packed pears are built up into carload lots, and to load out, a fork truck is used to unpile and to transport the loads to the carloading dock where they are set down near the car door. As fruit is needed, the loaders use a special pallet jack to pick up the pallets and transport them pallet end first into the car and down its length to the loading position. (See Fig. 4.) This was the only equipment found that would make the turn into the car for this purpose. Some cars require 3/16 in. steel plates on the floor to facilitate transportation over the floor racks. These plates are made up in a convenient size to handle, three ft. by four ft., and a path is laid from the car door to loading position. As the car is loaded, the plates are removed one at a time. As each pallet is emptied it is carried out to the platform by the loaders and stacked and a new pallet load transported into the car.



An electric-powered tow unit engineered to push as well as pull loads, and to be used where heavy equipment is not justified or dangerous has been introduced by Rocky Mountain Steel Products, Los Angeles. It has a claimed turning radius of 63 inches, top speed of 8.5 m.p.h., four intermediate forward and reverse speeds and a snub nose for pushing. Length is 77 inches; wheel base is 30 inches.

"Big Savings in CARGO HANDLING"

"We installed Clark fork trucks to handle the wartime load, and have used them continuously since for handling all types of general cargo. We know that our operations would be severely handicapped without the use of fork lifts — know that they have saved us big sums in handling costs."

W. D. Williams, Secretary
Wilmington Terminal Warehouse Co.
Wilmington, North Carolina

Instead of thinking how merely to protect that vital margin between steadily-rising costs and productive capacity limited by space, habits and traditions, why not find the way to widen it? Clark can really help you here.

Tap the huge fund of useful experience that is constantly available to you through Clark's world-wide organization of trained men. As a matter of "good business" CONSULT CLARK.

CLARK ELECTRIC AND GAS POWERED FORK TRUCKS AND INDUSTRIAL TOWING TRACTORS



INDUSTRIAL TRUCK DIV., CLARK EQUIPMENT COMPANY BATTLE CREEK 11, MICH.
REPRESENTATIVES IN PRINCIPAL CITIES THROUGHOUT THE WORLD
AUTHORIZED CLARK INDUSTRIAL TRUCK PARTS AND SERVICE STATIONS IN STRATEGIC LOCATIONS

Marine Terminals

(Continued from page 27)

vessels, must devise means of loading cargo *without pallets*, but by mechanical means. We give here-with some of the experiments conducted and the results attained.

1. In the handling of import woodpulp many different techniques were tried to replace the old hand-handling method. This commodity arrives in bales squaring variously 5½ to 7 sq. ft. and weighing 346 to 500 pounds per bale. By hand, dock labor moved this cargo at the rate of about 2.75 to 3.25 tons per man-hour. From a standpoint of speed of movement and profit this was very bad production. Pallets were tried in many ways, but labor required for handling onto and off of pallets permitted an increase only to about 4.5 tons per man-hour. Further, there was considerable loss of cubic space due to varying bale sizes. A new type fork, 26 inches long, fully tapered, and highly polished on the upper surface, was then adopted. With the cooperation of the stevedore contractors, the pulp bales were placed on the

transit dock three bales high as removed from the vessel. The new forks slide under and lift three bales at a time, taking them direct to the car or to storage in the pier in-transit storage warehouse. In car work, the bales are stowed as lifted from the dock, averaging about 200 bales to the car. In storage, they are stored six bales high with one-inch strips between each three-bale tier to facilitate forking down when shipped from the warehouse. With this technique of operation, production as high as 18 tons per man-hour has been attained and a sustained eight-hour operation has shown as high as 11 tons per man-hour for one or more full gangs. This production not only clears the transit dock faster, but makes the profit element a certainty.

2. The movement of canned goods from shipside to car presented almost an identical situation in that the old hand-handling methods were producing only about 1.6 to 2.1 tons per man-hour. Palletization increased this only to a

maximum of 2.5 tons per man-hour because of the necessity of expending labor to stow the cargo on pallets and the expending of further labor to break down the cargo from the pallet in the car.

A new technique of using a single-faced pallet in an inverted position, has been developed but is still somewhat in the experimental stage. This pallet is 52 in. long, 42 in. wide, with five 4 by 4 in. supporting struts and is constructed for loading canned goods in 12 46-oz. can-size cases and 6 No. 10 can-size cases. Depending on the case sizes, different dimensioned platforms are constructed and each load templated or bricked to tie the completed draft directly on top of the struts so that when the forks lift the draft it is tight. The fork bearing surfaces are located so the draft can be transported without case shifting or spilling. As examples of this templating, two case-size templates are used. The first is for the cases containing 12 46-oz. cans. The template of the first and second tiers are then alternated for eight tiers, making a draft of 68 cases. Depending on the interior width of the railroad car, the second draft going into the car must be templated to fit the width remaining after placement of the first draft on the car floor. For cases containing 6 No. 10 cans the template would be different and a much tighter load obtained. The first tier would be identical to that shown for the 46-oz. cases.

Again the template of the first and second tiers are alternated eight times, making a draft of 72 cases. Again, depending on the interior width of the box car being loaded, the second draft being loaded must be templated to fit after the first draft is placed on the car floor. In most cases, drafts have been constructed that would cover up to within a 3-in space between drafts so that by alternating large and small drafts as the load comes forward from the ends of the car, the car load can be securely tied. Of course, it must also be realized that the number of cases in the drafts and the draft tem-

(Continued on page 54)

CARBON MONOXIDE IN WAREHOUSES

An interesting new development in the handling of materials with gasoline-powered equipment is a recently perfected muffler that eliminates carbon monoxide from the engine exhaust. This device is a baffle chamber muffler somewhat larger than the conventional type and contains a catalytic agent in the form and size of small marbles. The engine exhaust heats the catalyst and the chamber to a point at which the carbon monoxide (CO) in the exhaust is oxidized to carbon dioxide (CO₂).

Recent tests of the new muffler by U. S. Navy Engineers showed the exhaust from a four-cylinder gasoline engine to be free from CO despite racing and idling of the engine. The CO detector used in the tests reacted to the smoke from a cigarette, but showed no reaction to the exhaust from the new muffler.

Three limitations should be noted in connection with this new development. First, the catalyst does not function with gasoline containing tetraethyl lead. The lead forms a deposit like a coat of paint on the outside surface of the catalytic agent and insulates it completely. Therefore, white gasoline must be used in connection with the new muffler. Diesel engines present no difficulty. Second, if the muffler is installed on a fork truck in which leaded gasoline has been used, the entire gasoline engine, tank, and feed lines must be purged to clean out all trace of the lead. Third, when starting, a short warm-up period is required to heat the chamber and the catalyst to the proper operating temperature at which the complete change from CO to CO₂ takes place.

At present, the new muffler is somewhat larger than the conventional type—about 14 inches long and 11 inches in diameter. However, models of different sizes and types are being designed to meet the needs of various types of gasoline-powered fork trucks. Several of the fork truck manufacturers are working out muffler designs to fit their machines just as diesel bus makers are preparing to install the muffler on buses. Under these circumstances, it is believed that any warehouseman who is interested in eliminating the carbon monoxide hazard in his plant would do well to address the manufacturer of his gasoline-powered equipment to learn what adaptation the manufacturer is making in the application of this new muffler to his materials handling machines.

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A Vacuum

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such a shipping unit. It serves splendidly in a number of shipping situations and has a wide range of uses. The fault lies in John becoming "married" to cleated fibreboard and, come what may, seeking the solution within the range of his preferred type of container.

Paul, handling a similar responsibility at activity "C", is a convert to wire-bound boxes. Again, wire-bound wooden boxes accomplish a variety of shipping assignments with every credit to this style of box. But there are times when the type of load, the need to transfer weight from within a box to load-bearing frame-members secured to skids, or other external factors in loading or stacking, may demand a different type of shipping unit. Over at "D", Ben corners every shipping unit with two-by-fours, whether required or not, while Smitty, at activity "E", may find all of his answers in plywood.

Bill, the packing-master in activity "F", starts everything mounted on a wooden platform and builds upward. Dan, in whose hands activity "G" leaves all decisions on packing, believes no shipping unit is complete until it is encircled by wooden cleats, even when this creates a shipping hazard. Fred, at the next call, never varies from a style #2 (full-headed) box, whereas Dick insists that style #4 (headed) box with cleats on only two sides is really the only thing.

How is the routine approach, so ingrained in personal habits, so divorced of administrative interest, to be corrected? How can flexibility and adaptability be inculcated into individuals sending forth goods in transportation? The task becomes easier when the individual learns that he has not one choice but as many, figuratively, as the piano has keys; it is up to him to combine the keys that will determine the most utilitarian and safe package in the entire range. Once the packing superintendent or foreman avails

(Continued on page 55)

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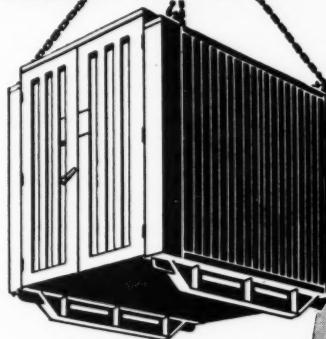
Damaged Goods
Faulty Packing Wastes
About \$1 Billion Yearly
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Handling in Terminals

(Continued from page 52)

plates must be related to the lifting capacity of the mechanical equipment used.

The actual hoisting of the drafts is performed by regular fork lift mechanism but by using four 36-in. forks instead of two. The forks should be fully tapered the entire length and highly polished on the bearing surface. These four forks will then fit in between the inverted pallet struts and will lift the entire draft as a unit load without the use of pallets or strapping.

These unit load drafts are then taken to the car and the first draft placed directly on the floor resting on the forks. No stripping is used. The forks are withdrawn by backing the lift truck away from the drafts. It requires an experienced operator to back the first six inches of fork from under the draft. Thereafter the forks slide very easily without disturbing the position of the cases. If trouble is experienced in slightly disturbing the cases bearing on the forks, a buffer board can be used. This buffer board, usually 2 by 10 by 4-in. in size, can be placed against the cases so disturbed, and with a slight pressure of the forks against the buffer board the load is evened up. Experimentation and practice on this technique will surprise the most skeptical. Drafts on the second tier in loading cars are handled the same way. The draft is lifted to proper height and the forks are dropped directly on top of the first tier without dunnage strips, and then pulled directly from under the load, using the buffer board again to straighten any slightly disturbed cases.

Warehousemen generally will be interested in this unit load technique in their storage operation. By inserting 1 by 3-in. strips between drafts, canned goods can be stored two or three drafts high with a resultant saving of approximately 18 percent of the over-all cubic space lost by palletization.

This has been tried very successfully but care must be used to place the 1 by 3-in. dunnage striping at about the same position as were the struts on the platform from which the load was hoisted. This maintains the same fork bearing points on the drafts for lifting from storage to car or truck. For trailer movement, 4 by 4-in. struts can be secured to trailer beds and used in the same manner for transporting drafts for longer distances. It will be found, after some experimentation, that drafts can be handled without load spillage. To convince yourself of the practicability of this technique, regular 36-in. forks can be used for experimenting by the application of a very light mixture of flake graphite and oil to the fork bearing surfaces.

3. Bagged goods also present a very interesting problem both from a standpoint of in-transit storage as well as carloading. Experiments have been tried on most types of

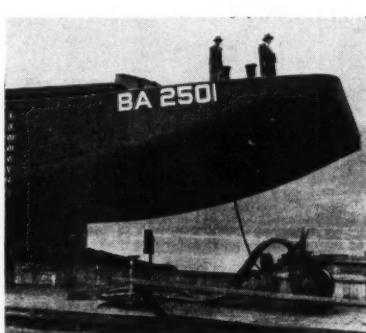
bagged goods with remarkable results. To give a brief idea of its workability, we cite the handling of African cocoa beans in bags weighing approximately 140 pounds.

The same size inverted pallet platform was used on these bags as was used for the 46-oz. and No. 10 size canned goods cases. Also four fully tapered and highly polished forks were used on the lift trucks. The bags were templated across the pallet struts, one vertical to two horizontal, and reversed on the second tier, etc. Tiers are carried to five high, making a draft of 15 bags or 2100 pounds per lift. In car work, the second draft usually consisted of but 10 bags or 5 tiers of two bags each, alternate horizontally and vertically on each tier.

The results obtained were as follows: Hand gangs were producing anywhere from 2.66 tons per man-hour to 3.42 tons per man-hour. With the mechanized technique shown, this tonnage immediately rose to between 5.26 tons per man-hour and 5.73 tons per man-hour.

An analysis of the above will, I believe, show that mechanization and its higher productivity can and does help speed up ship loading, preserves fluidity of transit docks, and enables a terminal operator to handle more vessels at a given berth. The higher per-man-hour production in turn creates a greater volume of tonnage, with its resultant increased employment. At the same time, we are providing the means to shorten the stay in port of our newly proposed fast and mighty merchant fleet.

As has been stated, the developments discussed above are the result of experiments and may be considered still in the trial stage. It is hoped that warehousemen who read this will be prompted to conduct further tests of their own along these lines. The Committee on Materials Handling of the American Warehousemen's Assn., Merchandise Division, desires to be informed of any such work done, for it is only through individual experimentation, co-ordinated through a central exchange agency, that real progress can be made.



Bow end of the first barge in a fleet of six specially designed 240-foot vessels for transporting dry bulk cargo, primarily sulfur and salt, on the Intracoastal Waterway and the Mississippi River and its tributaries, is shown just before it was launched into the Ohio River at the Neville Island Shipyard of Dravo Corporation, Pittsburgh. The articulated barges are being built for Butcher-Arthur, Inc., Houston, Texas towing firm. With a 50-foot rake end and a square stern, the welded steel, covered barges are to be used for high-speed two-barge towing operations.

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A Vacuum

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himself of information on other types and styles of containers and what each particular type of construction or weight of material achieves, his single standard ideas will quickly melt away.

Unfortunately, only occasionally does a single track mind shake off complacency and make use of a wider range of technique; the natural tendency is to be proud of one's craft and, from being vain, it is a short step to a closed mind against any new ideas or suggestions.

Men: you who are actually engaged in the physical preparation of freight, we ask that you reflect upon your operations. If every container which you fabricate follows one basic specification and the contents itself vary in weight, bulk, distance and condition of travel, then it is time you reassessed your knowledge of what can be done to greater advantage with a wider choice of handling. There are texts and guides which may be purchased or which may be obtained free by requesting: The U. S. Department of Commerce, Washington, D. C.; or your nearest regional office; the Forest Products Laboratory, Madison, Wise. Army-Navy manuals are excellent sources for guidance. Container associations and many manufacturers offer excellent material, but of course, these are limited to specific fields: wooden box, corrugated, wire-bound, plywood, etc.

What is needed to overcome this barrier of shop tradition is the exchange and dissemination of ideas. There must also be a greater development of codes and rules on freight. There is today a perceptible tendency towards these goals, and leaders in transportation, traffic management and related fields should continue to push for published standards to cover a greater range of items. When these have wider circulation, industry will drop unwise single standards in freight preparation, quickly enough.

ROSS HEAVY DUTY LIFT TRUCK



CUTS HANDLING COSTS 50% for The Imperial Desk Company, Evansville, Indiana



All lumber used in the manufacture of Imperial's well-known quality office furniture is handled by a Ross Lift Truck. Over a period of two years, this machine has consistently moved and stacked this lumber at a saving of 50% of former cost!

Arriving at the plant via rail or truck, the packaged lumber is unloaded, stacked in the yard for air-drying then transported to the mill. These operations are accomplished by the Ross in a fraction of the time required by former handling methods.

This is another of the many examples of what Ross Lift Trucks can do for you. Why not get all the facts about Ross?



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Getting down to Cases

By LEO T. PARKER
Legal Consultant

WAREHOUSING

Things You Can Do

YOU CAN limit your liability for negligent loss of stored goods if you prove that the owner of the goods expressly or impliedly agreed to the limitation. For illustration, in *Page v. Ace Van & Storage Company*, 196 Pac. (2d) 816, Calif., the testimony showed facts, as follows: A truck driver for the Ace Van and Storage Company picked up for storage four rugs at the owner's home. At this time the owner signed two instruments, copies of which were given to her. The first was a "work order." Near the top of the instrument, conspicuously enclosed in a box and in clear type, appeared a notification that unless a greater value was stated in writing, the owner "declares that the value in case of loss, or damage, whether arising out of the storage, transportation, packing, unpacking, or handling of the goods, and the liability of this company . . . is limited to 10 cents per pound, and a maximum value of \$25 for any one piece or package." Also, the owner signed another document, called an "inventory," which contained four entries, each reading "Oriental rug," with its size and the word "used." The above mentioned limitation of 10 cents per pound or \$25 for any one piece was printed on the inventory which was signed by the owner. A day or two later, the owner went to the warehouse company's office where she signed and was given a copy of a third document labeled "Warehouse Receipt and Contract" which also contained a clause that the warehouse company's liability was limited to 10 cents per pound and that there was a maximum value of \$25 for any one piece or package.

The warehouse company admitted that through negligence of its employees the rugs valued at \$2,180 were lost. The higher court held the warehouse company's liability to the owner was only \$75. This court said: "Mrs. Page named no higher valuation and secured a lower rate of storage by expressly declaring in three instruments that the value did not exceed the amount named therein." Also, see *Wilson v. Crown Transfer etc. Company*, 201 Cal. 701. This higher court held a limitation clause valid which was plainly printed on the face of a warehouse receipt. The owner denied reading the limitation clause.

YOU CAN omit the rate of storage on warehouse receipts without invalidating the receipts. For example, in *Sampsell v. Lawrence Warehouse Company*, 167 Fed. (2d) 885, a trustee in bankruptcy for the Reed Furniture Company brought suit against Law-

rence Warehouse Company to recover for conversion of furniture stored with the warehouse company. The principal contention of the trustee was that the warehouse receipts were invalid because they failed to state on their face the rate of storage, in violation of the state's law. The higher court refused to hold the warehouse company liable, saying: "In many states which have enacted the Uniform Warehouse Receipts Act, the omission from the receipts of one or more requirements of the act has been held not to invalidate them."

YOU CAN invalidate a city zoning ordinance which restricts for residential purposes real property suitable for warehouses. In *Northwest Merchants Terminal, Inc. v. O'Rourke*, 60 Atl. (2d) 743, Maryland, it was shown that a municipality enacted an ordinance which rezoned and restricted an area for residential purposes. A warehouse corporation contested the validity of the ordinance which restricted for residents the corporation's real property along a railroad right of way. The higher court held the ordinance unreasonable, arbitrary and contrary to public policy and therefore void.

Things You Can't Do

YOU CAN'T avoid paying wages specified by the Fair Labor Standards Act to employees who advance sale or movement of goods in interstate commerce. For example, in *Spaeth v. Washington University*, 213 S. W. (2d) 276, Missouri, it was shown that a watchman was hired by the owner of a large warehouse to guard goods, check freight cars and protect against fire and theft in the building. The higher court held that the employer must pay the employee back wages and attorney fees amounting to \$1,171.07, saying: "The watchman, guarding goods, checking the doors of freight cars to see that they are closed, and protecting against fire and theft, was engaged in an occupation necessary for the production of goods."

YOU CAN'T have a valid contract if you neglect to accept an offer until after death of the one who made the offer. For illustration, in *New Warehouse Company v. Gentry*, 212 S. W. (2d) 325, Kentucky, it was shown that the New Warehouse Company leased a warehouse from its owner. Sometime after the lease was signed, the property owner wrote to the warehouse company stating that if the company could within the five years build an addition to the warehouse at cost of not less than \$25,000, he would extend the lease. The warehouse company did not accept this offer until after the property owner died. The warehouse company filed suit to compel the prop-

erty owner's executor to fulfill the agreement. The higher court refused to hold in favor of the warehouse company, saying: "The death of a party while a contract is being made, even though only a single act remains to be done, renders the completion of the contract impossible." This court also explained that the contract would have been valid if the warehouse company merely had acknowledged the property owner's letter saying that the company accepted the offer.

YOU CAN'T avoid responsibility on a verbal promise to extend a lessee if the testimony shows that the lessee expended money improving the leased property. In *Zuckman v. Freermuth*, 23 N. W. (2d) 541, Minnesota, it was shown that a person named Zuckman leased a building for ten years, at a stated rental to be paid monthly. The landlord verbally promised that he would extend the lease at the same rental for an additional period of five years. In subsequent litigation the higher court extended the lease for an additional five years, and said: "Plaintiff (tenant) made large expenditures on the strength of the promised extension."

TRANSPORTATION

Things You Can Do

YOU CAN obtain a certificate or permit to transport merchandise in an area now being served by a competitor, if you convince the Public Service Commission that additional service is "needed." For example, in *Lyons Transp. Company v. Pennsylvania Public Utility Commission*, 61 Atl. (2d) 362, Pennsylvania, a motor transportation company held a certificate of public convenience to transport merchandise in a specified area. The Public Service Commission amended the certificate giving the company authority to operate in an extended area. Another transport company objected, but the higher court held: "In this case, the commission found that existing motor carrier transportation service in the area affected by this application is not of a type or character which satisfies the public need and convenience and that the proposed service would tend to correct or substantially improve that condition."

YOU CAN avoid liability for damage to a shipment caused by fault of the shipper. In *Boh Brothers Construction Company v. Perry Henry Haulers*, 166 Fed. (2d) 719, it was shown that a company shipped a machine by freight and did not securely pack it. The machine was damaged during transit and the shipper sued

(Continued on page 61)

Mechanization +

(Continued from page 17)

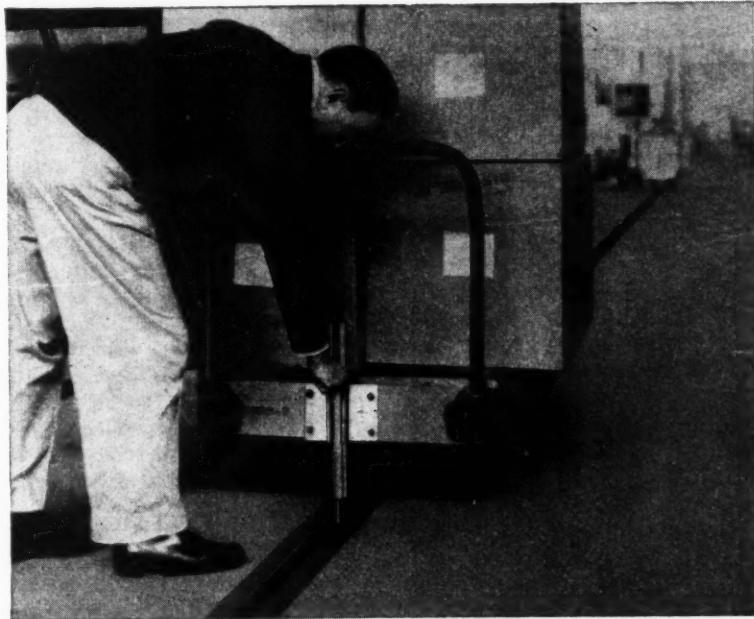
specific cases the gain has been anywhere from 35 to 50 percent. This in turn would mean a reduction in handling costs of almost the same proportion."

Typical of the manner in which all of the company's warehouses now operate is the functioning of its Elizabeth, N. J. warehouse. Of the 1.3 million square feet comprising the total storage area of the company's four warehouses, the Elizabeth division's area occupies 580,000 sq. ft. To service this area, which handles machinery, foodstuffs, electrical appliances and steel in lifts up to 4½ tons, and in addition has an Internal Revenue bond room and a tax paid bottling plant, the company utilizes 15 hand trucks, 40 four-wheel trailer trucks, two overhead traveling cranes, 14 fork trucks (ranging in capacity from 2,000 to 6,000 pounds, and in height of lift from 120 to 220 inches), and approximately 15,000 pallets all of which are the 40 x 54 inch double-faced two-way variety which the company has adopted as standard for all its warehouses.

One of the tasks which the swing to mechanization has simplified for the Elizabeth division is that of storing heavy appliances. The division's appliance storage area has several bays, each consisting of a large, open well, on two sides of which are 18-foot balconies. Formerly, because of the difficulty of elevating merchandise, much of this balcony space was wasted. Now, by using 220-inch lift fork trucks, these storage areas are readily accessible. The trucks lift such items as washing machines and refrigerators on pallets. A smaller truck, moved to the balcony by a conveyor, then picks up the pallet loads and tiers them up to three high. Similarly, when items are destined for outward shipment, the larger capacity fork trucks move them to the highway trucks at the shipping dock.

Mechanization of the Internal Revenue bonded section of the Elizabeth warehouse presented a unique problem in that all changes

(Continued on page 59)



WEBB *Towveyor*

**FLOOR TYPE
TOW CONVEYOR**

● **FAST**—Operator Drops Pin In Slot, Walks Away . . .
No Loading Time Lost.

● **CLEAR FLOOR**—No Obstacles . . . You Can Truck
Over It Easily.

● **FLEXIBLE**—Can Be Routed As Required . . . Disen-
gaged Anywhere Along The Route.

The Webb Floor Tow Conveyor is a new type chain conveyor running in a slot below the floor. Standard shop or warehouse trucks, either 2 or 4 wheel are used. The simple towing pin mechanism is bolted to the front end. Uncomplicated, easy to operate. No overhead structure to interfere with floor traffic.

From the time of its founding, 30 years ago, Jervis B. Webb Company has been identified with improvements in all types of conveyors and has pioneered many of them. Webb Overhead Trolley Conveyors, Power and Free Conveyors, Slat, Drag Chain, Belt, Roller and Portable conveyors are reducing costs, speeding production in thousands of plants and warehouses.

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Proper Pay

(Continued from page 42)

presupposes that the **forwarder** will charge the airline rate. No other assumption is, however, possible in view of statements made in the Forwarder Case. Years ago in rail transportation the forwarder shared the spread in rates with shippers, but, that practice has long since been discontinued.

(2) Despite the relatively high rate that shippers will actually pay for air cargo service, the rate of return to the air carriers, who bear the responsibility for providing that service will be the much lower volume rate at which the forwarder turns over the traffic, this difference being perhaps as much as 15¢ per ton-mile. In the CAB Minimum Rate order it was suggested that carriers establish minimum rates above the floor. Receipt of small individual shipments requiring individual handling from forwarders at the lowest quantity rates cannot help the carriers maintain a rate structure much above the minimum but can only accelerate the descent of the rate of return to the lowest possible minimum. (3) The air carriers' freedom to experiment with volume rates for the purpose of developing new types of traffic will be limited if not made impossible. A "developmental" rate, if the forwarder can continue to operate on the spread, will simply enable him to collect small shipments at higher rates from shippers and turn them over to the carrier at the low rate. Any reduction in rate of return to the carrier will not be passed on to the shipper, but will solely benefit the forwarder.

American Airlines took the lead in pointing out to the CAB that the above consequences will indisputably attend the operation of forwarders on this spread. "Only the extent to which rates to the shipper will be kept high, returns to the carrier low, and legitimate developmental efforts hindered, remain to be seen. If the forwarder develops traffic in volume as has been urged in support of his certification, or if he intercepts traffic in volume as has also been urged, the result will be the same. A sub-

stantial portion of all traffic will come to the underlying carrier at the lowest permissible rates—though the shipper will continue to pay the higher rates."

Forwarders, seeing the possibility of profit, may desire to operate on the spread in air transportation as they have in rail. But that is no reason why they should be permitted to do so if the true differences in the two types of transportation are realized. The forwarder's chief claim to recognition is the traffic it is hoped he can develop for the air carriers. He can make no significant contribution to the performance of the line-haul transportation in the air. It is in this fact that the great difference between air forwarding and rail forwarding lies. A railroad would rather handle a car, loaded with forwarder traffic, than they would the many l.c.l. shipments of various shippers going to make up that car. There is no similar situation in air transportation as has already been pointed out in this discussion.

In fact, no benefit promised by forwarders depends upon their ability to operate on the spread. Forwarders claim special competence in developing traffic for the air carriers and providing some miscellaneous services to shippers. To neither of these services is operation on the spread in rates or con-

solidation essential or even necessarily involved but they are, rather, the means by which the forwarder has traditionally secured his compensation. But the method of operation on the spread has not applied in ocean transportation, in motor carrier operations or in international air transportation in all of which the forwarder figures prominently and his compensation is determined independently of the spread in rates which may exist. Only in rail transportation has the practice of compensating the forwarder on the spread been maintained for very good reasons applicable there but not in other means of transportation.

The compensation of the forwarder in air transportation should be measured directly by what he does rather than indirectly by a spread in rates quite unrelated to his operations. Rate discounts, which give rise to spreads are perfectly legitimate and a necessary means of developing air cargo; they in no way reflect the forwarder's contribution to air transportation, to the shipper or to the carrier. The forwarder could be directly and fairly compensated by a uniform commission established by the Board and to be paid by all carriers to all forwarders for all traffic developed by them. The spread in rates would thus be of no concern to the forwarder, he could not trade on it and he would be required to pay the air carrier the tariff rate on each individual shipment collected by him and tendered to the carrier.

A uniform rate of commission, established by the CAB, would not only compensate the forwarder for his actual contribution to air transportation in a fair and direct manner, but it would serve other important purposes in the regulation of forwarding operations. It would certainly remove any incentive that the forwarder otherwise would have to hold or consolidate shipments in order to accumulate volume, something the air carriers fear as tending to slow down air cargo service and increase their cost by making it more difficult for them to utilize equipment. A uniform rate of commission would

(Continued on page 61)



Unit Crane and Shovel Corp., Milwaukee, has introduced a self-propelled mobile crane with 4-wheel drive which is controlled and operated by one man. The manufacturer stresses its short turning radius and claims easy, instant control by the operator. The crane has four speeds and air-actuated brakes and is powered by one engine.

Mechanization +

(Continued from page 57)

required the sanction of the Internal Revenue agents in charge of the section. The company by conducting a second survey, had found that by placing drums of alcohol four to a pallet and tiering them three high with a fork truck, they could accommodate three times the number of drums possible under a manual system. The agents agreed to the switch from manual to mechanical, but specified that an "electric, explosion-proof truck" having "spark enclosed" construction should be used. They further stipulated that if pallets were used, the resting surface of the drum had to be flush with the pallet. No overhang was permitted.

Palletizing of barrels of wine, whiskey, or other spirits was not allowed because it was felt that the direct weight of the pallets resting on the bottom barrels might cause spreading of the staves and subsequent leakage. There was no objection, however, to the handling and the placement of barrels in

racks by fork trucks. Such a system was adopted. Barrels are now removed from a conveyer leading from the cars to the bond room, placed on trailers, and then raised by a fork truck to the rack, whence they are rolled off and stored. In this way the company has eliminated the manpower formerly needed to roll the barrels long distances from the conveyer to the rack, and dispensed as well with the use of the slow, manually operated elevator which was formerly employed to move the barrels from the floor to the rack.

The company has found that the

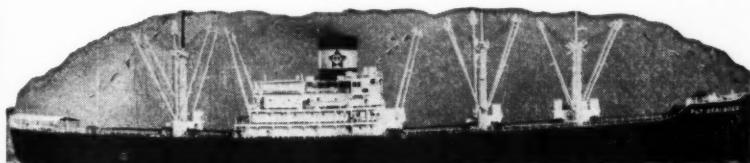
Tub-Type Truck

A Stainless Steel sanitary Tub-Type truck, for use in paper mills, meat packing plants, food processing, etc., has been introduced by Market Forge Co., Everett, Mass. The "tub" has a 1,000 lb. capacity and weighs 200 lbs. It is also available hot dip-galvanized. Dimensions are: outside, 60 inches long, 30 inches wide, 25 inches high. Large wheels are 8 inches, small wheels 6 inches in diameter.

advantages it derives from palletization in its Elizabeth warehouse apply equally to its other metropolitan New York warehouses; in Newark, Jersey City, and Brooklyn. All commodities are palletized before they are stored except, Mr. Cooke pointed out, "where it is impractical . . ." Where merchandise is received on pallets, fork trucks move the palletized loads from railroad car or highway truck to storage area. In filling orders, the same fork trucks place the loads on the tailboards of the highway trucks or in the freight cars. The company has pointed out that, in the handling of l.c.l. deliveries out of the warehouse, there were instances where it was not possible to make fuller use of materials handling equipment. This is explained by the fact that such operations are virtually "order picking," and from 25 to 50 percent of the l.c.l. handling must be done manually. Notwithstanding, the company states that a large segment of its handling operations is mechanized. Despite this, there was an actual increase in employment at one of the warehouses.

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ARGENTINA

Marine Refrigeration

(Continued from page 50)

top and bottom of the apron which can be adjusted to suit the type of cargo being carried.

Homogeneous pre-cooled cargoes are usually carried at the same temperatures recommended for shore side storage. When it is necessary to carry mixed cargoes in the same compartment, a temperature must be determined which will be suitable for all of the perishables. The Applications Volume, Refrigerating Data Book, Second Edition The American Institute of Refrigerating Engineers, Pages 124-5, shows the most favorable conditions recommended for warehouse storage and is used as a guide for marine transportation.

Packing and Containers

The following is quoted from Refrigerating Application Data No. 43 on the subject of packing and containers: "Claims made by shipper and consignee upon the carrier for unsuccessful outturn, pilferage, and short delivery are of arresting proportion, and it would not be an exaggeration to say that 75 percent of these claims are due to faulty containers and packing methods."

Containers that suffer most damage are those made of veneer board in which frozen meats and poultry are shipped. The contents give poor support to the walls of the containers when handled. Fiberboard cartons, similarly packed, are subject to collapse and the difficulty in high piling and orderly stowage is obvious. Crates and lugs are often over-thin or are of poor grained wood with imperfect assembly and insecure nailing. Collapse of these containers and the scattering of contents are frequent.

Crates packed with bulges supported by the product are sometimes used to accommodate shrinkage in storage. Bulge or open slat crates filled with fruits, tomatoes, and similar commodities should be fitted with cardboard "collars" or paper top-liners; all bulged containers and poorly constructed crates, lugs, or cartons should be reinforced before delivery to the ship's side.

Frozen food packages usually fill

High Speed Truck

Transitier Truck Co. has a gas powered fork lift truck designed to load-unload at high speed. The body is of welded heavy gage steel stampings. The Hydroflex clutch is located behind and above the engine for easy accessibility and can be adjusted or changed in a few minutes. The truck weighs one ton and is available at different lift heights. Address Portland, Oregon.

their fiberboard cartons and give good support to the carton walls. However, the cartons are generally made of materials not resistant to moisture when exposed to warm air, while being transferred to the ship or upon discharge, atmospheric moisture is deposited on the outside surfaces. If they are not of good insulating value, the moisture appears as frost and in stowage or piling tends to freeze the packages together. If they are of good insulating material, the moisture will often deposit as sweat, the outer laminations will lose their structural strength, and glued fastenings may part.

Fiberboard cartons, unless of exceptional specifications should be bound with flat band strapping instead of wire which will cut the carton during handling. In all cases the wires or strappings should be so placed that the contents can-

not be crushed or cut. Use of wires or bands as handles for moving with stevedore hooks should not be permitted because this procedure will result in broken fastenings or damaged contents.

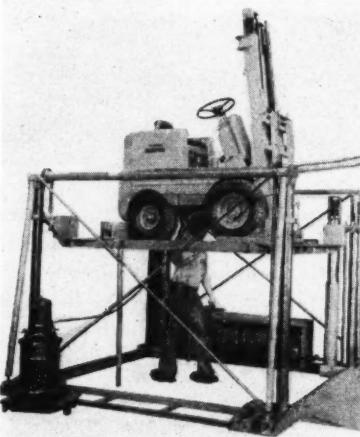
Reciprocating Compressor Performance

The development of quick frozen foods and the increase in its distribution has influenced the design of cargo refrigeration. Previously, refrigerated cargo compartments were designed for a minimum temperature of 0 deg. F. Some shippers of quick frozen foods require -10 deg. F. to be maintained. To obtain this temperature it is necessary to operate the compressor at suction temperature of approximately -25 deg. F. for direct expansion systems or -35 deg. F. for indirect or brine systems. At a condensing temperature of 105 deg. F., this results in a compression ratio of 10.4 and 13.3 respectively. Freon-12 reciprocating compressors not equipped with water packets reach the limit of practicability at a compression ratio of about 12. At higher compression ratios, it is usually advisable and economical to use two compressors in series either by direct staging or by cascading. A curve of the volumetric efficiency for a typical Freon-12 reciprocating compressor is shown in the chart. A comparison of the performance of a typical reciprocating Freon-12 compressor operating at various suction and condensing temperatures is shown elsewhere.

It is to be noted that the overall volumetric efficiency falls off sharply as the compression ratio increases. It is also interesting to note that brake horsepower per ton is doubled when the suction temperature is reduced from +15 to -20 deg. and is more than tripled when the suction temperature is reduced to -35 deg. It is, therefore, important to carefully select the maximum permissible temperature to be carried during the voyage.

In certain applications, the multi-stage centrifugal refrigerating machine has been found to have many advantages, among which are the following:

(Continued on page 63)



Service Caster and Truck Corp., Albion, Mich., has a new maintenance lift designed to handle industrial trucks. This device is an hydraulic lifter for servicing all makes of trucks as well as industrial trailers. Capacities are 6,000 lbs. and 12,000 lbs. Safety features include hooks which lock into the legs at any point of rise, and safety pipes.

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Proper Pay

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by no means make it unnecessary for the Board to exercise all possible diligence in the supervision of forwarder operations but it would provide a sounder basis on which to undertake such regulation than would the spread in rate which might be susceptible to forwarder pressures not easily detected.

All of the functions which forwarders urge they can and will perform could be carried out for air transportation on a commission basis. Development of traffic has been traditionally carried on through agencies.

Should CAB make it clear that forwarders are not to be permitted to operate on the spread in rate, but rather on the basis of a uniform commission, a great step would be taken toward making it possible for aircargo forwarders to develop traffic on a basis consistent with the interests of shippers, airlines and the forwarders themselves.

Getting Down to Cases

(Continued from page 56)

the carrier for damages. The higher court refused to allow any damages, saying: "The injury to the machine occurred through the fault of plaintiff (shipper) in improperly preparing the machine for shipment, and the damage having thus been sustained through the act and fault of the shipper, the carrier was not liable."

YOU CAN recover damages from an automobile owner whose negligence was the proximate cause of a wreck. In *Southwestern v. Wafter*, 208 S. W. (2d) 614, Texas, the testimony showed that a driver stopped a bus after dark near a bridge on a highway. A driver of a truck approaching from the rear suddenly applied brakes which were not properly adjusted and pulled the truck into an approaching automobile. Hence, due to defective brakes on the truck the latter collided head-on with an approaching car whose occupants were seriously injured. It is interesting to observe that the higher court held the bus company solely liable on the theory that the bus driver's negligence in suddenly stopping the bus without giving any warning signal was the proximate cause of the collision. This court said: "The fact that Summers (truck driver) was guilty of negligence in driving the truck with defective brakes does not conclusively establish that the bus company was not guilty of negligence or that its negligence was not a proximate cause of the damage."

Things You Can't Do

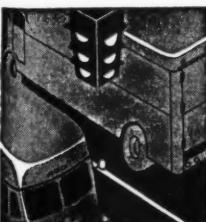
YOU CAN'T avoid paying damages instead of compensation to an interstate employee injured through negligence of your truck driver. For example, in *McManaman v. Johns Corporation*, 81 N. E. (2d) 137, Illinois, it was shown that a railroad freight conductor sued the Johns Corporation for \$25,000 damages for injuries received when a motor truck hauling roofing for the company crashed into the side of a freight car standing on a crossing. The freight train was transporting roofing in interstate commerce. The conductor was pinned between the truck and the freight car. He sued for damages rather than accept compensation allowable under the State Workmen's Compensation Act. The higher court awarded \$25,000 to the conductor, saying that if the conductor had been injured while performing work in intrastate commerce he would have had to accept compensation specified by the State Workmen's Compensation Act.

YOU CAN'T avoid paying compensation to an employee injured through his own negligence, providing he did not violate a state law. In *Melcher v. Murphy Ice Company*, 31 N. W. (2d) 411, Nebraska, it was shown that an employee rode two and one-half blocks on the running board of a motor truck. Another vehicle collided with the

(Continued on page 69)

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A Warehouse Packing and Crating Service

BY CHARLES L. SAPERSTEIN

Packaging Consultant

Many warehouses, now established on a specialized basis, may find the organization of a packing and crating service most profitable. However, it is necessary that such service be both extensive and expert, and be organized along the most modern lines.



Consolidating a shipment.

A CERTAIN amount of packing and crating is inevitable in a warehousing operation. Even those who are least expected to offer such a service, the cold storage warehouses, must have facilities for recovering broken cases or for opening containers for inspection. On the other hand, warehouses specializing in storage of household goods have always been prepared to pick up uncrated goods and do necessary boxing and crating either for shipment or for long-time storage.

The general warehouses (those handling all classes of merchandise) as well as those specializing in one or more fields (tobacco, machinery and equipment, textiles, liquor, tea, coffee, etc.) may or may not go after packing, boxing and crating work. These activities are beyond those arising unavoidably from the in and out movement of goods. Those who do go after this business try to make the packing and crating department a profitable enterprise in its own right. They seek and advertise for packing and boxing contracts over and above goods which are regularly warehoused.

Those warehouses which do not go after an extensive packing and crating business are content to ware-

house and distribute goods. They see the warehouse service as one which is confined strictly to matters pertaining to receiving and unloading, storing, accounting for goods and ultimate aid in the outgoing movement of merchandise entrusted.

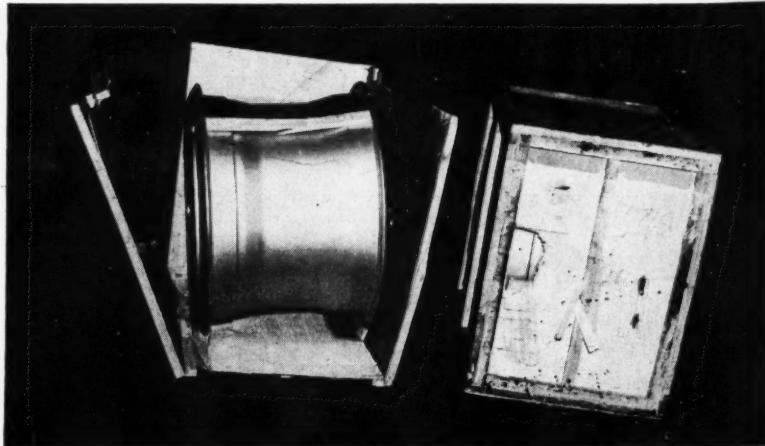
The relative size of a warehouse organization appears to have little bearing on policy concerning a packing and crating service. Some of the largest warehouses and terminal operators have fostered a reputation as a center for boxing and

crating goods. Others, equally large, are not organized to take in goods solely for the purpose of preparing for shipment. Some very small warehousing facilities do nicely with their packing and crating service. Others in the smaller group have never seen fit to develop packing along with storage and shipping.

For the purpose of this study we interpret packing service by a warehouse as something broader than remedial packing of damaged or

(Continued on page 64)

Box-type construction was inadequate to the needs of the heavy brake drum.



Marine Refrigeration

(Continued from page 60)

1. Occupies less space than any other type.
2. Inherently more efficient than other compressors under comparable operating conditions.
3. Has fewer wearing parts, reducing maintenance costs to a minimum.

The centrifugal refrigerating machine is available in sizes greater than 100 hp. and is, therefore, limited to large installations.

Centrifugal Refrigerating Machines

Six C-3 cargo vessels, completed shortly after the end of World War II, are each equipped with two 4-stage Freon-11 centrifugal refrigerating machines, directly connected to 250 hp. turbines. The refrigerated space is divided among 13 compartments, each equipped with a Carrier cold diffuser and capable of maintaining any temperature from -10 deg. F. to +55 deg. F. This

installation has proven highly successful, particularly in the transportation of frozen foods at -10 deg. F.

Fish Freezing at Sea

The Department of the Interior recently announced that a project to freeze fish at sea for later processing on shore is the first item on the technological research program of the Fish and Wild Life Services

Branch of the Division of Commercial Fisheries for the fiscal year. It was further stated that the preliminary tests, using new techniques, have been encouraging. It is proposed that the fish will be quick-frozen in the round aboard the fishing vessel immediately after the catch. It is then proposed to defrost the fish on shore so that fillets can be cut, and then re-frozen and stored. Valuable by-products, which are now mostly dumped overboard would be recovered on shore, to produce fish meal, vitamin oils and other pharmaceutical products.

Performance of Typical Reciprocating F-12 Compressor (Liquid subcooled 10 deg.)

Condensing Temperature, F.....	+105	+105	+105	+105
Suction Temperature (Corresponding to suction pressure at Compressor, F.....)	+15	-5	-20	-35
Item				
Compression ratio P2/p1.....	4.3	6.6	9.2	13.3
Refrigeration Effect btu/lb.....	49.7	47.6	46	44
Cycle Efficiency, %.....	76	71	66	61
Coefficient of Performance.....	4.1	3.2	2.6	2.1
Overall volume efficiency, %.....	75	65	52	35
Brake hp per Ton.....	1.6	2.3	3.2	5.3

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FEBRUARY, 1949

63

Crating Service

(Continued from page 62)

opened containers or a more active approach than placing regularly handled household goods, china and bric-a-brac in crates, slings and barrels for moving purposes. Whether a warehouse can be identified as offering an independent packing and crating service would well depend upon an affirmative reply to all three of the following questions.

When a local manufacturer or shipper seeks a qualified firm as his (in effect) shipping preparation room, does the service offered by the warehouse facility appear equal or superior to that offered by the professional packing, crating and processing companies? Does the warehouse or storage company take positive steps to be classified among firms which are available for packing contracts? Does the warehouse or storage company actually maintain packing experts or engineers and a qualified staff and does it have adequate physical space and materials to take on packing assignments as they come in, independently of the merchandise customarily carried in storage?

The warehouse which can answer, "yes," to these three questions is in the packing and crating business. Those familiar with the number of public warehouses represented in directories of packing and crating services may well ask whether every storage company isn't giving this service. Actually, in spite of many companies which are spearheading the packing and crating service in their drive for new business, the great majority of warehouses today either do not meet these three standards or prefer not to emphasize this phase of their service.

In a survey covering 526 Eastern Seaboard warehousing firms in all categories, only 87 were found to be offering expert public packing and crating services apart from their storage operations. In the same geographic area there were packing and crating service organizations of all types (including the 87 from the warehouse field) totalling 255. This indicates that warehousing, storage and transfer firms account for only

one-third of the field. Certainly, in packing and crating, the public warehouses are in the best position to dominate the business. There are many reasons why this should be the special province of our great warehousing and terminal operators.

1. It is imperative in any activity of receiving, storing and forwarding merchandise that there be some facilities for re-cooperating containers.
2. This activity, if worth doing at all should be done by skilled personnel.
3. Having a nucleus of a service group to do remedial work, and having the problem of overhead to contend with, it is only a step to broaden its activity into a profitable, income-producing service for industry seeking packing assistance.
4. Normal remedial packing in

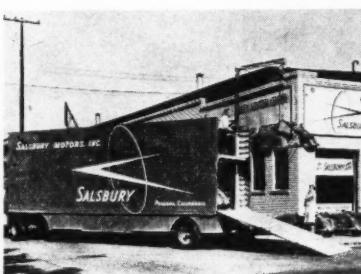
many warehousing terminals is often not very creditable. With a broader activity, all work is accomplished in a professional manner. The packers become experienced in handling a variety of jobs involving all techniques. Also, the tools and materials are more likely to be available for any packing assignment which may be presented.

5. New freight and customers attracted by the packing and crating service feed volume into all of the other services offered by the modern warehouse.
6. The warehouse or terminal which is responsible for goods expertly packed (from the preparing of the interior contents to the final stenciling and strapping) is unconsciously sending forth advertisements to the four corners of our land that are destined to return big dividends.

To become a leader in packing and crating services so as to have it serve as a lodestone for attracting new customers, the warehouse packing room cannot be anything less than an extensive and expert one. It must be capable of analyzing each type of material and determining the best method of packing.

It is important in organizing the packing room to give some thought to supervision and controls covering open, unboxed cargo. It is one thing to transfer the contents of an occasional crushed container to another box. It is something else where there is a considerable amount of open merchandise awaiting packing. Keeping lots together is important. But the control must go further: The right component parts must make up the right set; the correct weight or count of bulk goods must be placed into each packed unit according to its markings; items by sizes, color and grade must find themselves in containers reflecting correctly their specifications; goods with serial or tag number must not deviate from inside and outside markings—these are the little details which a control system should make fool-proof.

It is costly to verify contents



A classic example of integration in the field of distribution is a truck trailer with double-deck body designed to carry "scooters." This product of cooperation between the Fruehauf Trailer Co. and Salsbury Motors, Inc. of Southern California also mounts a unique boom; this boom, an integral part of the trailer body, loads or lowers a motor scooter from the top deck. In addition, a full length end-gate with folding extension swings down to serve as a ramp.

The boom is fitted in a sleeve at the extreme end of the trailer panel; when not in use, the arm of the boom swings across the end of the trailer, locks in place and serves as additional bracing for the unit. This portable derrick is fully adjustable and, with the end-gate, makes loading and unloading simpler. These new Fruehaufs have resulted in significant savings in delivery costs, have made crating unnecessary and have virtually eliminated damage in transit. In addition, greater loads are possible and maintenance costs are reduced.

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after the packing and crating is complete. A customer will scarcely return for more business if he has complaints from distant receivers that contents do not agree with information given on the outside. Another "must" proven by experience is that every packing job should originate from or be reduced to a brief but comprehensive work-order form. Proper control, proper billing and ultimate evaluation of the activities of those spending all or part of their time on packing and crating will hinge upon the execution of an accurate, simple work-order. The form should state exactly the nature of the work to be performed, the style of packing or crating, the authorization, the disposition of the goods after handling, marking instructions, to what man or men assigned and upon completion, the man-hours and materials used. A copy remains in a jacket with the goods; a copy in the foreman's office for unified control of all open jobs and one copy to the main office for billing and adjustment of storage control records.

The physical set-up of the packing and crating department is something on which generalizations would be more difficult. This of course must vary with each facility, with the size and scope of the warehouse, ease of movement between different parts, floors or buildings in a complex set-up and with the volume of packing and crating anticipated for the service.

The ideal situation is a central packing department to which all goods to be handled are routed, with the exception of outdoor heavy lifts. There are many situations where widely separated warehouse sections or buildings force the breaking up of the packing department into several locations. Other functions require mobile packing crews who are moved to the goods rather than the goods to them. More likely, in any sizable operation a combination of these arrangements will be necessary.

Whether packing and crating is done in a single location or not, there should be one general packing foreman administering the whole operation. Even with widely

separated buildings, there will be occasions when it will be advisable to borrow personnel from one location to help out a crew under pressure at another. Without single authority there can develop a lack of uniformity in methods of packing and in quality of results in the service offered by the same warehouse. If the general foreman receives copies of all work-orders when the job is started and notification on completion, he has his fingers on the activity of every crew wherever located and on the extent or backlog of work before them.

The writer was once given the assignment of organizing the packing and crating activities for one of our largest warehousing and terminal operations, one extremely active in various packing activities. A survey indicated that there were eleven separate and more or less autonomous packing operations going on simultaneously. In two not so widely separated groups of buildings (between which there was constant movement of goods) there were two complete packing shops,

(Continued on page 106)

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Government Warehousing

(Continued from page 48)

Since the war QM, in addition to pursuing its myriad duties as the Army's all-around procurement agency, has been doing a masterful job of purchasing fresh food supplies for all the armed services. The QM agent moves all over the country, from the Presque Isle section in northern Maine, where he is on hand to bid on new potatoes, to the Rio Grande Valley in southern Texas, where he markets for citrus fruits. Prices are teletyped into his office; he sends out his own prices; bids on the supplies offered; and finally directs the flow of his purchases to the various storage centers, where deep freeze lockers are available for use by QM's armed services customers. Price and supply figures of hundreds of commodities are followed hour by hour at the great QM center in Chicago. QM is proud of the fact that it buys strictly on a competitive basis. Its purchases frequently exceed two billion dollars per day. It has its own system of crop reports which come in by teletype daily, weekly, or semi-monthly, depending on the crop and the season. Foods are sent immediately to those sections where the demand is most urgent. For this reason, the men at the teletypes often divert shipments from their original destination while enroute. They manipulate their mobile supplies as the dispatcher at the nerve center of a railroad system manipulates his freight cars.

The major warehouses of the Quartermaster Corps are known either as "general" or as "quartermaster" warehouses.

1. "General warehouses. These warehouses are used by various branches of the Army (Division of Transportation, Medical Corps, Signal Corps, etc.) and by certain segments of the Navy and Air Corps.

2. "Quartermaster" warehouses. These warehouses are almost completely devoted to the needs of the Army, although they may house supplies used by the other services.

Although ordnance is stored in

certain of the QM warehouses, ammunition is kept in separate warehouses operated by the Ordnance Division. These warehouses are scattered in 40 major units all over the country. There are smaller units in Germany and Japan. The major storage facilities for explosives and similar materiel are located on the western deserts, where they present no danger to civilian communities. The most common ammunition warehouse is an "igloo." It is usually from 100 to 150 feet long, and is completely covered with earth. The 40 major units are known as main posts; there are others, some designated as sub-posts, others as inactive. The latter term, however, is a misnomer, because every storage facility in the country is in active use. The units in Germany and Japan are used to store materials which are expected to be absorbed within from three to six months. It is

noteworthy that whereas the Ordnance "igloos" are located in isolated areas, the regular QM warehouses are to be found in the nation's major cities. Important QM warehouses are located in Philadelphia; Charlotte; Memphis; Atlanta; Columbus, Ohio; Chicago; Kansas City; Fort Worth; Ogden, Utah; Stockton, Calif.; Seattle; and Riverside, Calif.

Service warehouses in the United States as well as in contiguous areas, usually have their own Diesel switching engines, trucks and trailers, and often have loading docks of varying capacity. All have fork trucks, and, naturally, abundant resources of pallets. In addition, they are supplied with IBM machines which enable the various services to keep track of the information required to gauge their daily and weekly needs. The services never refer to their warehouses or storage facilities merely as "warehouses." All facilities are known as "depots," "stores," or "igloos." Ordnance often uses the term, "dump," in referring to its great accumulation of underground ammunition. Apparently, underground storage is increasingly the trend for certain types of non-explosive munitions as well as for explosives. Also, less-than-carload lots seem to be the trend in volume shipments out of QM depots. Ordnance men seem reluctant to regard the usefulness of pallets in the pre-war sense. One Ordnance officer, describing supply problems in the Normandy landings, said that a combination of rainfall and soft earth caused a loss of precious materiel. Supplies had been palletized, but all but the heavier equipment sank, beyond salvage, into the mud. Even bulldozers and similar equipment were almost lost.

The Navy, the third member of the three major groups which must bear the brunt of the government's increased storage needs, has depots at all principal ports where it has installations. For the storage of certain types of materiel, the Navy employs its ships. In addition to procuring coal and fuel oil for the Army and Air Corps, the Navy has been the procurement agency for all coal and fuel oil which the ECA has sent to Europe.

Magnesium Ladders

The Aluminum Ladder Company, Worthington, Pa., has developed a new line of magnesium ladders for general industrial purposes, according to S. H. Carbis, founder and president of the company. In making the announcement, the pioneer builder of light weight industrial ladders indicated that the company would continue to manufacture marine and fire department ladders of aluminum, as well as certain industrial types. Reasons given for conversion to magnesium were: (1) the continued shortage of aluminum, and (2) the remarkable progress in magnesium alloys made during and since World War II.

Mr. Carbis, who built the world's first aluminum fire ladder, has followed closely the emergence of magnesium as a commercial metal in recent years. Magnesium weighs approximately two-thirds as much as aluminum; light weight, for easy handling and storage of ladders, has been a major interest of the Aluminum Ladder Company during the past 18 years.

In extensive tests, the new magnesium ladders have compared very favorably with their aluminum prototypes. Fabricated from a new alloy exhibiting the most satisfactory combination of rigidity, strength, corrosion resistance and wearing qualities, these ladders are as light and sometimes lighter than similar aluminum ladders. Like aluminum, they are spark-proof. Following the same designations as the aluminum ladders they replace, the new magnesium ladders include step ladders of all types, platform and warehouse ladders, and light and heavy duty extension ladders.

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Truckloads

(Continued from page 38)

"Would there be any probability of a shipper/consignee inducing a motor carrier to publish a less than truckload rate lower than the truckload rate on the exact commodity?" Flanders hinted.

McCormack chuckled. "It might be accomplished, but please understand that less than truckload and less than carload traffic is essentially class rate traffic.²⁹ Another point to note is that in 4 M. C. C. 755 the Commission stated: 'Rates less than truckload should apply on all shipments which are less than half the truckload minimum maintained in connection with class rates.' A less than truckload rate lower than truckload on the same commodity between the same points is unusual and requires special justification."³⁰



"All you have said leads me to wonder why truckload rates are not based on service cost instead of on so many other factors," Flanders complained.

"It may ultimately be found," McCormack conceded, "that both rail and motor carrier rates should conform to cost of service principles, but," he concluded, "at present motor rates cannot be constructed without regard to the competition of other carriers."³¹

²⁹ MCC 127.

³⁰ Fed. Supp. 832.

³¹ MCC 127.

³² MCC 559.

³³ MCC 429.

³⁴ MCC 55.

³⁵ MCC 597.

³⁶ MCC 619.

³⁷ MCC 747.

³⁸ MCC 619.

³⁹ MCC 619.

⁴⁰ MCC 619.

⁴¹ MCC 777.

⁴² MCC 153.

⁴³ MCC 791.

⁴⁴ MCC 755.

⁴⁵ MCC 5.

⁴⁶ MCC 700.

⁴⁷ MCC 368.

⁴⁸ MCC 375.

⁴⁹ MCC 375.

⁵⁰ MCC 689.

⁵¹ MCC 202.

⁵² MCC 755.

⁵³ MCC 87.

⁵⁴ MCC 87.

⁵⁵ MCC 337.

⁵⁶ MCC 337.

⁵⁷ MCC 455.

⁵⁸ MCC 410.

⁵⁹ MCC 233.

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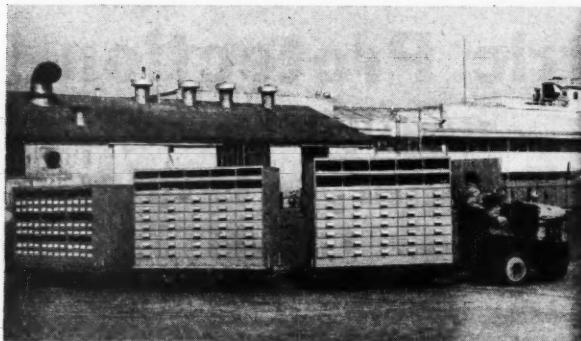
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MULTI-UNIT STORAGE SYSTEM

Highly mechanized and systematized warehousing is essential for a smooth-running production line. In an aircraft plant, where thousands of items running from exceedingly fine instruments down to sheets are involved, a warehousing system which is intricate but basically simple is essential to minimum costs and maximum efficiency.

By K. R. BENFIELD

EFFICIENT warehousing is a key factor when production requires thousands of parts of an almost infinite variety of sizes and shapes. Chaos could readily result in the channeling of materials to the production lines, were it not for some active, simple stockroom procedure.

Our "Purchased Parts and Paint Stores" department presents an effective warehousing method for handling a heavy volume of highly differentiated items. It is the most diversified and extensive stockroom within the plant, and is composed of various sections, each handling a distinct class of commodities.

Each section has its own procedure, which is analyzed below.

"Production Stock Items," Section No. 1, is the largest of the group. It stores and handles the largest quantity of separate items and, in proportion, has the most problems. Possibly its most interesting feature is its autonomous status despite close cooperation with all production departments. In fact, it operates in a building located well away from the production line. Since its principal stock in trade is bolts, screws, nuts,

Mr. Benfield is Chief of Material, Douglas Aircraft Co., El Segundo plant.

rivets, washers, etc., used by the thousands in every phase of production, this appears surprising. The method is simple, and possibly one of the most outstanding innovations used by a large production plant.

An analysis of production showed considerable loss of time and duplication of effort when shop departments had to be directly served from the main stockroom. It was found that the greatest volume of movement involved only some 500 to 600 different parts.

At first, smaller component stock rooms were considered, each servicing a given production zone. This meant added personnel, greater co-ordinated supervision, larger inventories to satisfy a larger stock replacement, etc. Although the problem of bringing parts to production would be solved by this method, increased personnel, area, equipment and overhead expenditures would be out of proportion to benefits derived. This plan was abandoned for the present, simplified and, it is believed, more effective method.

Individual production department supervisors furnished the "Stores" department with an initial parts requirement list sufficient to satisfy

(Continued on page 70)

Cases

(Continued from page 61)

truck and seriously injured the employee who was riding on the running board. In subsequent litigation the higher court held the injured employee entitled to compensation under the State Workmen's Compensation Act. For comparison, see Wiese v. Polzer, 248 N. W. 113. Here an employee was injured while riding on a fender of a motor truck. The higher court refused to award compensation to the injured employee because a state law prohibited persons from riding on fenders of automobiles.

YOU CAN'T avoid paying compensation to a person injured while under your control. For example, in Schiano v. McCarthy, Inc., 53 Atl. (2d) 527, Rhode Island, it was shown that an employee in a jewelry store assisted a truck driver to lift a barrel which weighed between three hundred and four hundred pounds. The employee sustained severe injuries. The higher court was asked to decide who must pay compensation to the employee: the owner of the jewelry store, or the owner of the truck?

The higher court decided that the truck owner was liable because the employee was taking orders from the truck driver when he was injured.

YOU CAN'T stop transporting merchandise without approval of the Public Service Commission although you are losing money. In Milo R. Maltbie v. Long Beach, 77 N. E. (2d) 21, New York, the testimony showed that a common carrier decided to discontinue operating its route because it was a heavy month-to-month financial loss. The Public Service Commission filed suit to enjoin the company from discontinuing the operation of its service. The higher court granted the injunction saying that public "need" for service is more important to the public than financial loss to the carrier.

PACKAGING

Things You Can Do

YOU CAN refuse to pay overtime wages under the Fair Labor Standards Act on bonuses paid to employees. For example, in De Waters v. Macklin Company, 167 Fed. (2d) 694, it was shown that an employer increased the hourly wage rates from sixty-five cents to ninety cents. In addition, the employees were paid extra money or bonus depending upon the amount of work they turned out. The higher court decided that the employees could not sue the employer and recover overtime compensation, because the employer paid one and one-half overtime figured on the total compensation received for straight time divided by the number of hours each employee worked. In other words, the court held that in figuring overtime the employer need not take into consideration money paid the employees based on "bonus" for the extra work they turned out.

YOU CAN avoid paying damages to employees injured in "horseplay". In Shedlock v. Cudahy Packing Company, 60 Atl. (2d) 514, Connecticut, an em-

(Continued on page 71)

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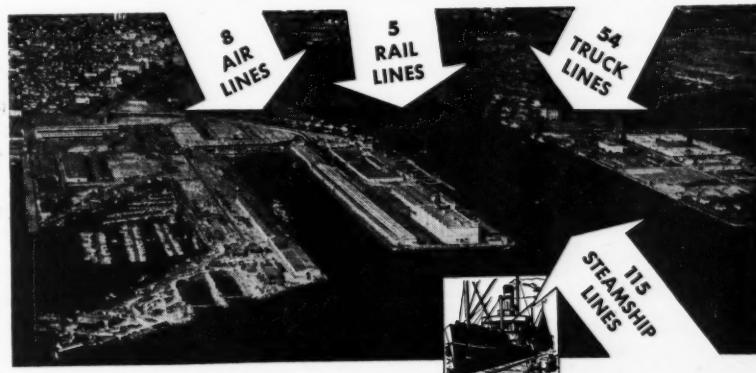
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MULTI-UNIT STORAGE SYSTEM

(Continued from page 68)

This form is used to charge out withdrawals of lesser quantities of Production Stock Items, supplies, etc. and/or similar materials not specifically serviced through regular delivery controls.

Original requests are made in the form of a departmental memorandum. However, subsequent changes to the original requirements are made on this form.

FORM 10-124 T-1000-1000		DEPARTMENTAL MATERIAL REQUISITION			
CREDIT ACCOUNT NO.	SERIAL OR EQUIPMENT NO.		FOR DEPARTMENT		CHANGE 1-UP ORDER OR RECD. NO.
	DATE		APPROVED BY		DRAWING NUMBER
THIS REQUISITION MAY BE USED FOR ONE ITEM ONLY.					
QUANTITY DESIRED	SIZE OR PART NUMBER	DESCRIPTION			TOTAL FOLDED
REMARKS:					
DATE FOLDED	FILED BY	OUT BY	INC. QTY/STK	LOCATION	POSTED BY
IN STOCK ITEM		STOCK ITEM REQUIREMENT CHANGE FORM 10-1238 (1-46)		UNIT COST	
				TOTAL COST	
DATE _____					
REQUESTED BY: _____ ASSEMBLY INVOLVED: _____					
DEPT. NO. _____			DEPT. SECTION _____		BIN NO. _____
EFFECTIVE DATE _____			EFFECTIVE ON S.O. _____		
OLD REQUIREMENT				NEW REQUIREMENT	
PART NUMBER		QTY. PER ASSEM		PART NUMBER	
REASON FOR CHANGE _____					
REQUESTING SUPERVISOR'S SIGNATURE _____					
COPY DISTRIBUTION: ORIGINAL TO DEPT. 523 - DUPLICATE TO DEPT. 521 - TRIPPLICATE TO DEPT. 561 - QUADRUPLE TO FILE					

their work in process. Information included part number, description, and quantity of daily requirements. From this data, service control charts were established by the stockroom. Next, three mobile delivery carts were designed to carry parts from the main stockroom through an established delivery route.

About 3,800 different parts are carried in Section No. 2, the "Owned Purchased Parts" department. These are all small parts or assemblies purchased for specific aircraft contracts. Each of these parts must be routed and charged to a definite shop order and may not be issued in bulk as is done in the case of production stock items.

"Government - Owned Purchased Parts," Section No. 3, are handled exactly as in Section No. 2. The only difference is that materials in this section have been purchased for use on contracts and must be kept segregated from company inventories. The exact list of these items is almost identical to those stored in Section No. 2.

All tools furnished by the company are handled by Section No. 4. Grinding wheels and belts, rivet gun replacement parts, drills, skin clamps, cutting tools, etc., which employees are not expected to furnish, are issued to "Plant Perishable Tool Maintenance" departments who maintain tool cribs throughout the plant. Employees may obtain such tools as they require by means of tool checks.

"Maintenance, Repair and Operating Supplies," Section No. 5, handles all the items incidental to plant operation. Approximately 4,300 items, including air hose, bolts, bearings, electrical switches, paper bags, etc., are controlled in this section.

Section No. 6 carries stationery used in the factory. All pencils, pens, printed forms and blank paper supplies used in engineering, tooling, accounting and personnel operations are stored here. As in the case of production stock items, the materials carried in the stationery stockroom have such wide

usage that multiple item requisitions are used. In order to eliminate expensive inventories of slowly moving stock, stationery is issued in quantities not to exceed a one or two week supply. The use and purchasing of these supplies are coordinated through a "Forms and Procedures" department, where requests for new forms are scrutinized carefully in an effort to efficiently and thoroughly utilize all paperwork needed in plant operation.

"Miscellaneous Raw Stock and Special Equipment," Section No. 7, covers castings and forgings, rubber extrusion, acrylate plastic sheet stock, wire screen, and special equipment items. These last include instruments, gauges, oil coolers, and fractional horsepower motors used as actuators, hydraulic pumps, control panels, etc.

"Government Furnished Equipment," Section No. 8, services aircraft instruments, engines, propellers, radio and radar equipment which is furnished by the U. S. Government for incorporation into military aircraft. These materials

are restricted to handling by personnel who have been investigated by government agencies and specifically authorized for this type of work.

Section No. 9, a sub-division of Section No. 8, is located at the hangar by the airport for convenience in handling those G.F.E. items which are only installed in aircraft immediately prior to flight or acceptance.

"Paint, Chemical and Upholstery Stores," Section No. 10, carries all the barrel stock used in the factory; all the bottled or dry chemicals used in processing or heat treating metals; paint and allied stocks; and upholstering fabrics and materials. This section originally was intended to stock only paints, lacquers and thinners, but in the interest of segregating hazardous materials the other items were added. All other barrel stock, whether inflammable or not, is handled there because of the specialized equipment necessary.

The lumber yard, Section No. 11, occupies an area about 200 ft. wide by 250 ft. long.

Cases

(Continued from page 69)

ployee of the Cudahy Packing Company was seriously injured when engaged in a friendly wrestling match during the time he was supposed to be at work. The higher court refused to award compensation under the State Workmen's Compensation Act. The court said: "It seems clear that where an employee indulges in horseplay with his fellow employees during the hours of his employment his injuries cannot be deemed to have had any causal connection with his employment."

YOU CAN avoid payment of compensation to an employee injured while violating a state law. In Bogavich v. Westinghouse, 57 Atl. (2d) 598, Pennsylvania, it was shown that a state law prohibits employees carrying explosives on their persons. One day a loud explosion was heard and an employee was found dead. His dependents sued for compensation under the State Workmen's Compensation Act. Since the employee had explosives in his pocket, in violation of the state law, the higher court refused to award compensation saying: "Violation of law amounts to an abandonment of employment and is a complete bar to compensation for resulting injury."

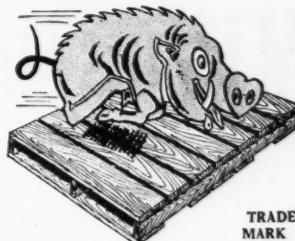
YOU CAN avoid damage liability to a purchaser injured through his own negligence while handling your packaged goods. For illustration, in Poplar v. Bourjois, 80 N. E. (2d) 334,

New York, it was shown that a woman was showing her sister perfumes and cosmetics when she pricked her finger on the point of a silvery metal star that adorned the gift box in which they were contained. A serious streptococcus infection developed, she became gravely ill, and the infected finger had to be amputated. The woman sued the manufacturer of the perfumes and cosmetics for damages. The woman claimed that the box which caused her injuries was "dangerous to life and limb." The higher court refused to hold either the retailer or manufacturer liable, saying: "As a general proposition, liability for negligence turns upon the foreseeability of any harm resulting from the careless conduct, . . . As matter of law, an article such as the Bourjois box may not be regarded as inherently dangerous, a menace to health and life."

Things You Can't Do

YOU CAN'T recover damages from a seller or lessor of packaging machinery which fails to operate efficiently, if the testimony shows that your employees were negligent in its operation. For example, in Shuttleworth Canning Company v. Crown Can Company, 165 Fed. (2d) 974, it was shown that the Shuttleworth Canning Company entered into a written contract with the Crown Can Company to lease an Angelus and a Cameron closing machine to a canning company. After the Cameron

(Continued on page 74)



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Misusing Pier Space

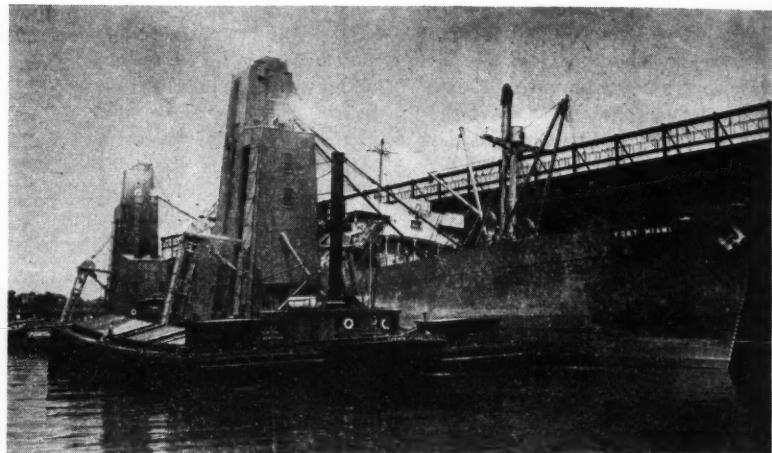
Many piers are being used to store goods for nominal fees which do not compensate for the value of those properties. Rather than convert a pier into an impromptu storage area to provide income in slack periods, back-land areas could be used, freeing piers for normal service.

By L. J. COUGHLIN,
President, Bayway Terminal Corp.

A PORT cannot accomplish much unless it is equipped with adequate piers. Pier construction is very expensive—more so than usual today and in the foreseeable future. Yet, in visiting some ports, instances are found of these valuable pier properties being used for purposes entirely foreign to the original concept for their construction—the entrance and exit of ship cargoes. Admittedly, there is a need at times to use piers for ship fitting-out, for repairs, bunkering, etc. Also lunch rooms and the general miscellany one notes on a waterfront walk as occupying valuable pier space are probably all essential to the normal conduct of harbor business.

However, one of the uses that should scarcely be tolerated, is the use of piers, especially one-deck piers, for "term" warehousing. The word "term" does not refer to "free time," namely, the reasonable period granted to owners of goods to deliver or receive their wares and for which service, at most ports, an owner pays a top wharfage or tollage charge. Reference is made, rather, to instances where goods remain on valuable piers for months, and also, only too frequently, at rates that bear no earning relationship to the high value of the property housing those goods—or, for that matter, to the high value of the goods themselves.

When a situation like this is discovered, a variety of reasons are advanced for it. The one most frequently given is the familiar and generally overworked one of "poor



competition." This may all be true, but it is a little ridiculous to store a commodity worth \$500 a ton and take all the responsibilities and risks that go with it, for a monthly storage fee of 25 or 50¢ per ton. And this storage is taking place on a pier costing upwards of \$20 a sq. ft. to build, or at least replace, and that figure does not include the cost of land. Of course, there is also the old story of dull times and a quick chance for revenue, against the broader thinking of looking ahead to the piers as an asset to attract trade.

Admittedly there is a temptation, if business is dull, if there is an opportunity to get new business to a port, to use a pier facility as a storage warehouse. It does not pay because the rates obtained will never be high enough to compensate for the value of the property. Warehousing just cannot be performed at a real profit on property costing \$20 per sq. ft., and somebody—the stockholder, the user, or

the taxpayer—is going to make up the difference.

There are possibly a hundred million sq. ft. of space devoted to public merchandise warehousing in the United States. Most of this space is in the interior, or at least back from the waterfront, but through transit and other arrangements, much of this off-water space is in competition with port warehouses.

Under today's conditions, it is unprofitable to operate a public warehouse in space costing over \$4 per sq. ft., exclusive of land. The most optimistic would not put the figure at over \$6. So what chance has a pier, costing what it does, to compete profitably against \$4 space, especially at a low rate level? It may be argued that with a low level of income from dockage, wharfage, etc., warehousing on piers sometimes pays higher than handling of transit cargoes. This can be only too true, but the piers

(Continued on page 75)

People in Distribution

M. E. Bealey was recently appointed general manager of System Tank Lines, Inc., Seattle, Wash., petroleum transport firm. He was formerly superintendent of safety operations for West Coast Fast Freight, affiliate company of System Tank.

John T. Braxton has been named office manager of Bernis Bro. Bag Co.'s Minneapolis plant. He was former supervisor of burlap sales at the company's general offices in St. Louis.

Kenneth D. Davis has been named manager of the Esnail sales division for Elastic Stop Nut Corp., Union, N. J.

Raymond F. DeVoe was elected a vice president of Robert Gair Co., Inc., New York, manufacturers of folder cartons and containers.

James I. Ferris has been named sales manager of the Clark Hopkins Equipment Corp., Philadelphia.

Lon A. Fleener, of the White Motor Co., has returned to his former post as sales manager of the wholesale division in Cleveland, after serving for some time as assistant to the regional manager on the West Coast.

H. L. Francis will be Eastern traffic and transportation manager for Koppers Co., Inc., with headquarters at Kearny, N. J.

Frederick C. Hunter has been named traffic manager of Hills Bros. Co., producers of Dromedary Foods.

Abbott L. Johnson was recently elected president and general manager of the Asbestos Mfg. Co., Huntingdon, Ind.

Gilbert May was appointed traffic manager of American Central Division, Avco Mfg. Corp., at Connersville, Ind.

Bernard H. McGuiness, former works manager of the Passaic, N. J., plant of Hewitt-Robins, Inc., materials handling machinery manufacturers, has been named vice president of the company's Robins Conveyors Division.

R. L. Perin, former central division sales manager of the Continental Can Co., has been named general sales manager. He will be responsible for the sale of metal containers in all three domestic metal container divisions.

Eugene C. Schum has been named diesel engine sales manager of the Hamilton Division of the Lima-Hamilton Corp.

A. S. Thaeler has been appointed assistant marine engineer of the Pittsburgh Steamship Co., Cleveland, Great Lakes shipping subsidiary of the U. S. Steel Corp.

years' of service with the company.

Slick Airways, Inc., has appointed **David R. Stewart** to the post of treasurer for the airfreight company, following the resignation of **W. B. Langmore**, former vice president and treasurer.

American Society of Traffic and Transportation unanimously elected the following new officers at its third annual meeting, held recently in New York: President, **Charles H. Vayo**, general traffic manager, Eastman Kodak Co., Rochester, N. Y.; vice president, **E. G. Plowman**, vice president, U. S. Steel Corp. of Delaware, Pittsburgh; director of education, **Dr. G. Lloyd Wilson**, professor of transportation, University of Pennsylvania, and secretary-treasurer, **John W. Peters**, traffic manager, Delco-Remy Division, General Motors Corp., Anderson, Ind.

Associated Warehouses, Inc., welcome the following new members: Currier-Lee Warehouses, Inc., Chicago; Morewood Warehouse, Omaha, Neb.; Herrin Transfer & Warehouse Co., Inc., Shreveport, La., and Distributors Warehouse, Chattanooga, Tenn.

Canadian Warehousemen's Assn. has accepted Federal Cartage and Storage Co., Toronto, Ont., into its membership.

Common Motor Carriers Assn. of Buffalo recently elected the following officers: **Thomas W. Doran**, Consolidated Cartage Co., President; **Gordon H. Tooley**, vice president; **Harry A. Cermak**, secretary; **Ruf F. Goetz**, recording secretary, and **Don E. Van-note**, treasurer.

Ohio Valley Transportation Advisory Board elected the following new officers at its twenty-fifth anniversary meeting held recently in Cincinnati: General chairman, **E. C. Perkins**, sales manager, Appalachian Cools, Inc., Cincinnati; chairman, executive committee, **R. A. Whitty**, general traffic manager, Belknap Hardware & Mfg. Co., Louisville, and general secretary, **C. W. Memke**, traffic manager, Edwards Mfg. Co., Cincinnati.

Oregon Motor Transport Assn. elected these officers at the final session of their 1948 convention: **A. C. Pierce**, Medford, Oregon, of Pierce Auto Freight, President; **Leo Stout**, Portland, vice president, and **Walter Reddaway**, Oregon City, treasurer.

Society of Industrial Packaging and Materials Handling Engineers, Michigan Division, will be headed by the following officers this year: President, **H. C. Diefendorf**, materials handling consultant; vice president, packaging, **Richard A. Brand**, Ted Fordon & Associates; vice president, transportation, **Edwin F. Avery**, Fruehauf Trailer Co.; treasurer, **Randall E. Crabb**, Acme Steel Co., and secretary, **E. H. Van Wagoner**, General Motors Overseas Operations.

OBITUARIES

C. B. Carruth, 65, field secretary and cost accountant for AWA's Merchandise Division from 1925 to 1931, and former secretary of the Massachusetts Warehousemen's Assn., in Roxbury, Mass.

Dr. Fred E. Clark, chairman of the dept. of marketing, Northwestern University, and first president of the American Marketing Assn., in Williamsburg, Va.

George H. Clark, 71, retired assistant to the freight traffic manager of the New York Central System, at Tuckahoe, N. Y.

James A. Green, 55, owner of the Central Storage Co., Central Delivery Transfer & Storage Co., and the Serve Well Transfer Co., at Columbus, Ohio.

Ward B. Hiner, 68, pioneer in the motor truck and bus transportation industry, in Indianapolis. Mr. Hiner founded the Red Ball Transit Co., the Red Ball Motor Truck Corp., and the Available Crating and Shipping Co., and in 1925 built the nation's first exclusive bus terminal, in Indianapolis.

Paul C. Jones, President, Richmond Cold Storage Co., Richmond, Va.

William B. Magruder, vice president, Monumental Storage and Carpet Cleaning Co., Baltimore, Md.

Elliott Wymore, owner of the Wymore Transfer & Storage Co., Oregon City.

DISTRIBUTION BRIEFS

Acorn Packaging and Packing Corp. has acquired a new packing plant in the Bush Terminal district of Brooklyn, to handle increasing overseas shipments of heavy machinery, according to Jerome F. Gould, president. Acorn specializes in the processing and packing of merchandise for export.

Care Transport Co. is the new name of a motor transport line operating between Dunkirk and Erie, Penna., recently purchased by William J. Holehouse, of Buffalo.

Chain Belt Co. of Milwaukee has established a new Atlanta warehouse to serve the entire Southeast. It will be under the supervision of G. J. Schuelke, formerly of the Milwaukee office.

Dixie-Ohio Express Co., Akron, has completed construction on the latest of its 19 terminals in Columbus. Norman Dungan is manager of the new terminal.

Irving Levick and George E. Weichman, owners of the Market Terminal Warehouse, of Buffalo, have purchased the block-long Larkin building from the WAA at a reported cost of \$350,000. The building, which will be used as a warehouse, covers 7.2 acres and has a total of 1,388,607 ft. of space.

Merchants Transfer & Storage Co., Des Moines, Ia., has moved all storage operations into its newly-constructed warehouse. The building, which has eight car doors, will be operated with modern mechanical handling equipment.

Speedways Conveyors (Canada), Ltd. has recently been organized to handle the manufacture and distribution of Speedways products in Canada. W. W. Ruppel will be president of the organization, which has its headquarters in Winnipeg.

Cases

(Continued from page 71)

machine had been operated for two days a gear broke. The plant was closed for one day and a new gear was installed. Other trouble developed. Subsequently the officials of the cannery plant sued the Crown Can Company for heavy damages contending that it lost much time and money in spoiled tomatoes, cans, etc., due to defects in the machine.

On the other hand, the Crown Can Company proved that the cannery plant machine operator was incompetent; that the cause of all the trouble was the fact that the operator had placed the lids or the upper ends of the cans upside down, which jammed the machine and spread the guide rails; that the operator broke the base plate of the machine by prying on it with a crowbar. In view of this testimony the higher court held the Crown Can Company not liable.

YOU CAN'T refuse to pay wages, specified by the Fair Labor Standards Act, to employees who act as part time executives. For example, in *Kerew v. Emerson Corporation*, 76 Fed. Supp. 197, the testimony showed that one Kerew was employed as an associate engineer. Later Kerew was promoted to a field man. Part of his job was to see that production at the plants of sub-contractors was maintained at the proper standard required by the specifications. Also, he acted as an inspector. Kerew sued the employer to recover back wages, overtime, lawyer fees, etc., under the Fair Labor Standards Act. The employer argued that Kerew could not recover compensation based on the Fair Labor Standards Act because he was an executive. The higher court refused to agree with this argument. The court said: "... I am satisfied that the plaintiff (Kerew) was not engaged in an executive capacity."

YOU CAN'T expect to stop operation of a competitor's plant constructed in violation of a municipal zoning

ordinance, if it was constructed without complaint on your part. For example, in *Barksdale v. Allison*, 210 S. W. (2d) 616, it was shown that a company started construction, in a residential zone, of a plant. After the company had spent \$100,000 on the building, and its completion only required connecting the building with electricity and water, a competitor filed suit and asked the court to grant an injunction against completion of the building which violated the residential zoning ordinance. The higher court refused to do so saying: "Under such circumstances, the court was authorized to conclude that appellant's right to injunctive relief was lost by laches and estoppel."

MARKETING

Things You Can Do

YOU CAN prevent a competitor from copying and using your trademark. For example, in *Healer v. Bloomberg*, 73 N. E. (2d) 895, Massachusetts, the testimony showed that William Bond and Son has for many years conducted its business at the same location. Recently another company established itself in the same locality under the name of "Bond". William Bond and Son filed suit and asked the court to stop use of the name "Bond" by the competitor. The lower court granted an injunction against continued use of the "Bond" trademark. The higher court approved the verdict, saying: "The judge justifiably found that the word 'Bond' has come to have a secondary meaning as indicating the business of the plaintiff..." This court also held that "good will" of a business is recognized as a property right which will be protected against unfair methods of competition by rivals, and that two persons having the same name cannot use their names in a manner likely to deceive the public.

Coming Events

Feb. 6-7—15th Annual Meeting, Associated Warehouses, Inc., Hotel Mark Hopkins, San Francisco.

Feb. 6-38th Annual Meeting, American Chain of Warehouses, Inc., Fairmont Hotel, San Francisco.

Feb. 6—15th Annual Meeting, Allied Distribution, Inc., Mark Hopkins Hotel, San Francisco.

Feb. 6—Annual Meeting, Interlake Terminals Inc., Fairmont Hotel, San Francisco.

Feb. 7—Annual Meeting, Distribution Service, Inc., Mark Hopkins Hotel, San Francisco.

Feb. 7-10—58th Annual Convention, American Warehousemen's Assn., (Joint meeting of both divisions: National Assn. of Refrigerated Warehouses and AWA Merchandise Div.), Fairmont Hotel, San Francisco.

Feb. 21-22—Materials Handling Conference, Purdue University, Lafayette, Ind.

March 1-16—National Frozen Food Exposition, 71st Infantry Armory, 34th St. and Park Ave., New York.

March 8-9—National Marketing Conference, Domestic Distribution Dept., Chamber of Commerce, Neil House, Columbus, Ohio.

Apr. 10-14—17th Annual Convention, Mayflower Warehousemen's Assn., Buccaneer Hotel, Galveston, Texas.

May 9-11—Annual Spring Meetings, National Committee on Accounting, Council of Safety Supervisors, and National Committee on Street and Highway Safety, American Trucking Assns., Melbourne and Sheraton Hotels, St. Louis.

May 10-13—18th Annual Exposition, American Management Assn., Atlantic City.

June 1-3—Joint Spring Meeting, four materials handling associations: Assn. of Lift Truck & Portable Elevator Mfrs., Caster and Floor Truck Mfrs. Assn., Electric Industrial Truck Assn., and Material Handling Institute, Grove Park Inn, Asheville, N. C.

Pier Space

(Continued from page 72)

were constructed with advance knowledge of this fact. Money was requested from stockholders or taxpayers with no thought in mind except that the piers would be used for transit cargoes, and be available for solicitation of such cargoes through a port, thereby developing all lines of business in the port city and its normal marketing area. It is usually a sign of desperation or over-optimistic planning when properties such as valuable piers drift into alien uses.

Warehousing in a port—in a completely developed waterfront terminal—is essential and necessary. Properties used for that purpose should be carefully planned in advance and there should be an avoidance of the use of valuable piers for a purpose such as term storage. Rather, if a port is to be fully rounded out it must have ample and complete supporting warehouse facilities.

A survey would show that in many port cities there already exist strong warehouse systems with sufficient facilities and initiative to help develop business for pier facilities. The local warehousemen's association and the AWA, Merchandise Division, stand ready and willing to help.

Best of all, is the use of back-land, adjacent to but not directly on the waterfront, for erection of facilities to handle all essential port-stored commodities. Examples of what is meant are the Army bases constructed during World War I in Newark, Norfolk, Charleston, and New Orleans, where back-up storage space is available; the Army bases at Boston and Philadelphia, where the storage space is in upper stories not adaptable to transit cargoes; the supporting warehouses of Bush Terminal, New York Dock Company, and Poughkeepsie Terminal in New York Harbor. All of these are part of integrated terminals. This appears, by practice and thought, to be a way of taking care of commodities that might not otherwise enter the port, furnishing employment for piers, and yet not impeding those valuable doorways.



Gould School

A SERIES of practical one-week "schools" to teach better techniques of storage battery maintenance and repair to foremen, supervisors and engineers in those many industries which employ lead-acid batteries for motive power, standby or direct current supply, was recently inaugurated in Trenton, N. J., by Gould Storage Battery Corporation. Ten representatives from five of the largest coal mining enterprises in the United States heard nine lectures, tackled three do-it-with-your-own-hands laboratory projects, witnessed two major demonstrations, stood both written and oral examinations, and received diplomas, during five full days of this first Gould Industrial Storage Battery School.

So successful was this course for coal men (concerned with underground haulage costs) that, according to M. W. Heinritz, Vice President, future five-day schools will definitely be conducted by Gould for additional coal and metal mining groups, as well as for classes interested in (1) battery-powered lift trucks and material handling systems, (2) telephone and other communications systems, (3) railway car lighting, diesel starting and air conditioning, and (4) transportation signal work.

In order to handle the schools, Gould has set apart one large labor-

atory and office at its Trenton plant, fitted them with standard classroom equipment, purchased special test and charging equipment and tools, and prepared numerous displays to help the lecturers. The lectures given last week covered: storage battery theory, battery design, electrical theory, battery layout, charging methods, maintenance procedure, evaluating secondary haulage, and handling batteries underground. The laboratory projects and demonstrations for attendees included: assembling a complete cell and rebuilding a battery; charging batteries by different methods and setting up charging controls and schedules; repairing damaged batteries with proper tools and correct carbon-arc burning technique; and an inspection tour of Gould's battery manufacturing facilities.

One of the most noteworthy aspects of the new series of Gould Battery Schools will be their stimulation of better internal company training programs on battery care and use. Executives of industrial firms interested in sending key maintenance personnel to future Gould Battery Schools should correspond with Mr. Gilruth, Gould School Director, Gould Storage Battery Corp., Trenton, N. J., for arrangement of dates and subject emphasis. Applicants interested in the courses may write for particulars.

Public Warehouse Section

Warehousing is an integral part of distribution in several ways. Public warehouses are not merely depositories for the safeguarding of personal effects or industrial commodities; many are equipped to perform a wide range of services in addition to storage. Among these services are:

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This special advertising section of public warehousing has been consolidated for ready reference and maximum utility. It includes merchandise, refrigerated, household goods and field warehouses. For shippers' convenience, states, cities and firms have been arranged alphabetically.

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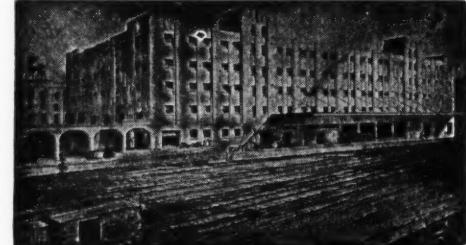


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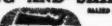
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To Matthew W. Potts, DISTRIBUTION AGE'S materials handling consultant, it seems strange that management will balk at financing materials handling equipment, when the immediate purchase of it means money in management's pockets, both immediately and far into the future in the form of service. His article next month, FINANCING MATERIALS HANDLING EQUIPMENT, gives the low-down on financing.

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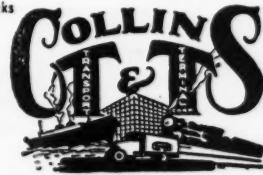
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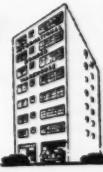
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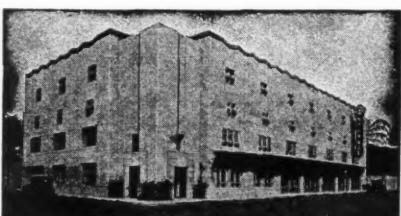
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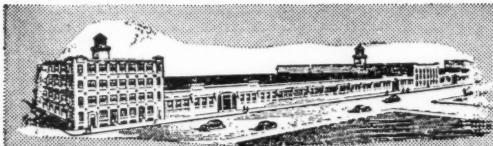
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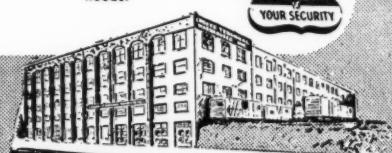


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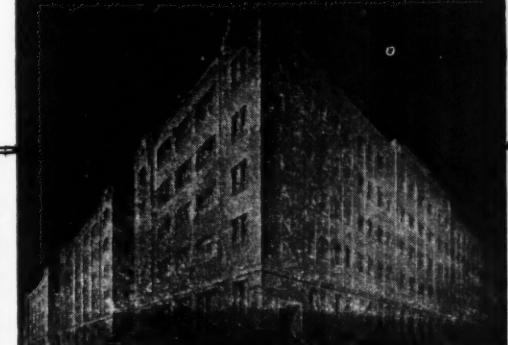
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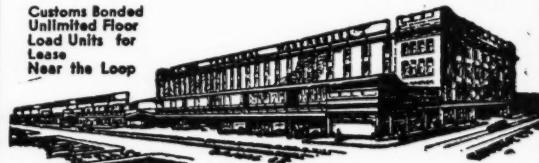
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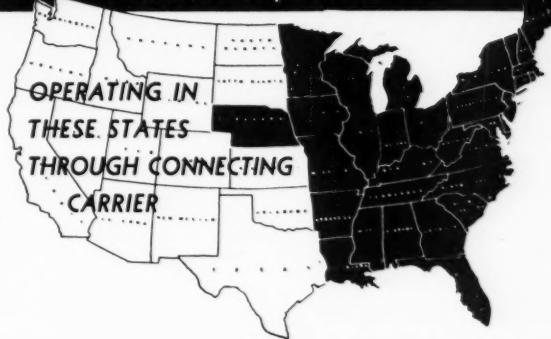
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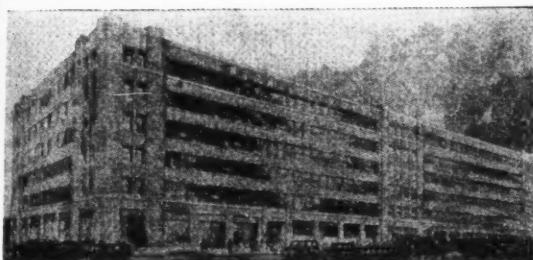
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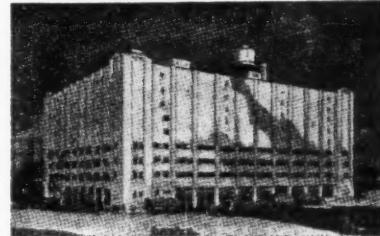
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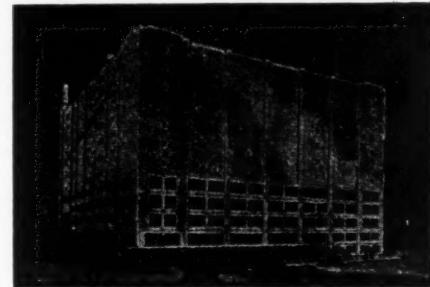
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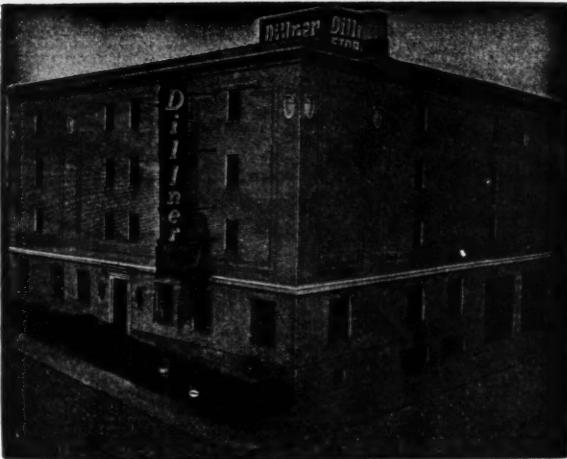


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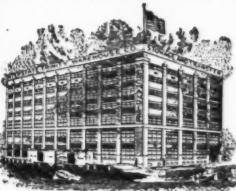
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SLARGEST AND MOST MODERN

rates as compared with modern facilities in other ports along the Atlantic Coast and as a result, the port suffers from this unfavorable competitive situation.

On April 16, 1948, a supplementary agreement was consummated between the Authority and the Boston and Maine Railroad for the purchase of the existing grain elevator facilities adjacent to the proposed Hoosac Pier and the lease of the said facilities after modernizing alterations and improvements are complete. The proposed alterations and improvements consist of the installation of new power shovels for unloading grain cars, grain gallery with conveyors from the elevator to and along the west side of the pier for ship loading of grain at a maximum rate of 30,000

Boston

(Continued from page 74)

will have a 20-foot working apron. Two depressed tracks with loading platforms will be located in the center of the building. Truck loading platforms and offices for steamship companies, stevedores, customs and pier operator will be provided at the inshore end. A utility building for longshoremen and cargo handling equipment repair will be constructed adjacent to the pier.

The substructure now under construction is of the steel sheet pile bulkhead type with a concrete relieving platform supported on green timber piles, the driving of which is now near completion. To date this contract is about one-third complete. Although progress is

ahead of schedule, completion could be accomplished at an earlier date if it were possible to get quicker delivery of steel sheet piling.

The Authority, after a careful study of the existing grain handling facilities in the Port of Boston, decided that the Hoosac elevator (which is in fair condition) should be rehabilitated. At present, the handling of grain is confined to the Mystic wharves which have a 500,000 bushel elevator in poor condition, and the Boston and Albany Railroad elevator, which is in fair condition and has a maximum capacity of one million bushels. Both of the aforementioned facilities have inadequate ship-loading

and Firms are Arranged Alphabetically

bushels per hour, supporting collecting conveyors under scales, bagging and sewing machines in the elevator with a conveyor to and along the west side of the pier. Contracts on this phase of the work will be awarded this winter and completion is scheduled at the same time as the pier at an estimated cost of \$525,000 including purchase price of the elevator.

The Port of Boston Authority has been authorized to spend not more than \$6,000,000 for the acquisition and development of new pier facilities on the site of the present Boston and Maine Railroad Mystic Piers, provided an agreement is consummated with a responsible party for the lease of the facilities for a period of 20 years. The proposed new pier will be approximately 900 feet long by 460

feet wide with a 250-foot working apron on the north and south piers and 20 feet wide on the east berth. The transit shed on the pier will be a one-story building, constructed entirely of fire resistant materials. The inshore end of the building will contain the offices, warm rooms, gear lockers and other appurtenant facilities. This pier will have a berthing capacity of three ships at one time. Provisions for rail cargo will be provided by tracks on the north and south working aprons and in the shed. Provisions for truck cargo will be provided with truck loading docks at the inshore end of the building and ramps for access into the shed.

When the Mystic River high level highway bridge is constructed, it is hoped that the drawbridge and viaduct over the South Channel will be

removed by the City of Boston, and an access road constructed. This would remove an impediment to navigation and highway traffic caused by the present draw, and would also result in a much improved terminal layout.

Such development would encourage activities through the port, and at the same time provide a source of considerable revenue.

Summing up the changes in process or in contemplation, three piers, a shed, new equipment for grain handling, and the development of a large terminal area are involved. Clearly, the work contemplated is only a small part of the Port work required and that private initiative is still a sine qua non for a really modern and progressive Port of Boston.

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LOCAL AND LONG DISTANCE MOVERS
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CRATING, PACKING and SHIPPING
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Crating Service

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each with its own box-making department. There were also two non-cooperating crews, working on outside storage. Several specialized warehouses had managed to foster individual packing and crating corners. The receiving platforms for both groups of buildings had gangs of re-cooperers. The outgoing loaders had a mobile group of carpenters for last minute repairs to heavy crates and for blocking of loaded cargoes. There was no uniformity of techniques. Some of the foremen had preferences for one type of box construction and would not permit their men to vary from such style. There were disagreements on strapping methods, forcing the stocking of several types of strapping tools and wire. Regardless of need, there was no exchange of labor. One or two groups put in all kinds of night and Sunday overtime. Others were idle during the day. There was no certainty on the part of any one in the operations end as to who would receive a packing job. Finally, there was jealousy, bickering and dissension. An executive inadvertently might request a foreman to do a job ordinarily the responsibility of another packing activity. Anxious to advance his popularity in the eyes of the front office, this foreman would make no effort to point out the error but, armed with the executive order, would take a group of men and "invade" the province of the other packing group. The bad feeling through such competition was intense and most unnecessary.

In time the entire set-up was streamlined. Overlapping activities were eliminated. Work orders for all groups were cleared through a single dispatcher. A capable administrative assistant was assigned to coordinate the overall activity. Foremen and crews were exchanged whenever necessary and personnel was broken gradually from the feeling of belonging to a certain job only. The volume handled soared. Production costs went down. On-the-job training made for increased efficiency and uniformity.

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& SERVICEHUNDREDS OF
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OPTIONS

HAVE YOU CHECKED

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Mass-Production savings and a nation-wide distribution network bring these finer Bodies to your neighborhood at a surprisingly low price.

No other body manufacturer offers you the wide variety of "Standard" options you'll find in the Fruehauf line. And, with Fruehauf "unit-built" design, both authorized Distributors and Factory Branches can add an unlimited number of "special" modifications to provide that custom-design at low cost.

Send for Truck Body Booklets and see why they are "better" built!

BODY DIVISION

FRUEHAUF TRAILER COMPANY

DETROIT 32

FRUEHAUF
TRUCK BODIES

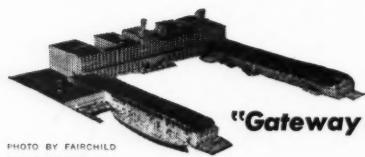
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